

NOTES

ON

VINEYARDS

IN

AMERICA

AND EUROPE.

BY THOMAS HARDY.

Adelridge:

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PREFACE.

THE following letters were written at the request of the proprietors of the Register and Observer newspapers, and have appeared at intervals in those papers during the past eighteen months.

During this publication many who read them have expressed a wish to have them collected in a pamphlet, and I naturally wish myself to see them preserved.

I have throughout endeavoured to express as clearly as possible what I saw, that was in any way likely to interest or benefit my fellow-vignerons, and did not consider any matter of detail as too trivial to note down, having often in reading books of travel in wine countries found the want of most explicit and close observation. As an instance, I found a paper in the first report of the Californian Viticultural Commission on Raisin-making at Mataga, in which the writer stated that the grapes were laid on earth. I went to the trouble to try this plan, and proved it a failure, as the grapes became rotten on the under side while drying. I found on my visit to Mataga that the floors were of gravel, and not earth, and on trying it at Bankside on my return, I found that the gravel floor was a complete success.

I trust that these letters may suggest to many the advisability of trying different modes of cultivation and manufacture of the fruit of the vine into Wine, Brandy, and Raisins, and the study of the effect of climate and soil on the produce which I believe to be all important.

Having been engaged in the cultivation of the vine for the last thirty years in this colony, I believe we have much yet to learn, and which, with extended experience and observation, will enable Australia to become equal to the best wine-producing countries of the world.

BANKSIDE VINEYARDS,
ADELAIDE.

March 23rd, 1885.

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THE VINEYARDS & WINE CELLARS OF CALIFORNIA.

CHAPTER I

CLIMATE OF CALIFORNIA.—ST. HELENA.—KRUG'S VINEYARD.—
IMPLEMENTS USED.—EXTENSIVE CELLARS.—DISTILLING APPARATUS.

HAVING determined to take a few weeks here among the vineyards and cellars in this country, I believe it will be of considerable interest to wine growers and all who take an interest in production to know what is being done here, and what are the prospects in the future for the wine industry in this country and in Australia.

This is a very large State, extending from 31° to 49° of north latitude, and embracing all or nearly all the same range of climate as Australia, and modified in many particulars by the formation of the country, the high mountain ranges giving abundance of water for irrigation in some parts, and the cool winds and fogs of the coast having a great influence on vegetation in other parts, especially north of this city; and as vineyards and orchards are widely scattered over the State I endeavoured to find out the localities where I could see most in the least time, and I was fortunate enough to light upon the right man to give me such information.

Mr. Charles Wetmore, the energetic Secretary of the State Viticultural Commission, received me most cordially, as is the general habit of all genuine vinegrowers, for Mr. Wetmore is one, and from him I got to know the principal growers and merchants. I am also indebted to our old friend Dr. Bleasdale (who I found hale and hearty, but not so stout as when in Australia) for some valuable information.

The first vineyards we visited (I being accompanied by my wife and youngest son) were those situated in the Napa Valley. Leaving the city by one of the immense ferry-boats which take in

thousands of passengers, wagons loaded, with two and four horses attached to them, trucks loaded with goods of all kinds, &c., we cross over to Oakland in about thirteen minutes, and take train to a narrow point of the bay. Here we take ferry again, and in a few minutes are landed at Vallejo Junction, near the town of Vallejo (pronounced Velay-o, the "j" being left out in all the Spanish names). From here to Napa City, 41 miles from San Francisco, and containing less than 4,000 people (why they call it a City I do not know), through fine agricultural and dairy land. Here vineyards commence; and from here on to St. Helena township, 18 miles, fully one half of the valley, which varies from two to five miles in width, is in vines. St. Helena is a thriving town of 1,300 inhabitants, and is beautifully situated among vineyards and fruit gardens in the centre of one of the richest valleys in California. The main street is planted with trees, many of them the Tasmanian bluegum, and, better still, several fine old spreading oak-trees have been spared, and stand in the street or on the footpaths, and give a cool and pleasant appearance to the place.

This we made our quarters for a couple of days, and visited some of the principal vineyards in the neighbourhood.

First we went to one of the largest, that of Mr. Charles Krug (no relation to the champagne Krug), about a mile up the valley. We found the proprietor at home, but as he had to attend the funeral of an old neighbour he turned us over to Mr. F. Pohndorff, who is a great man among vines, and has a good knowledge from personal observation of Spain and Portugal and other wine countries of Europe.

Mr. Krug's vineyard contains 225 acres, and is cut in two by the railway, which, however, is amply compensated for by the facilities it gives him for dispatching his produce. A small station siding and platform called "Krug's," close to the cellar enables him to put his wine into the trucks, and it goes "right away," as they say here, to New York, if required, without once being shifted out of the truck.

The vineyards are in splendid cultivation, and the size of the stocks show the goodness of the land, some near the house being larger for their age (20 years) than any I ever saw. The vines are mostly in bloom, and men were busy topping and sulphuring. Sulphuring is done by putting the sulphur into coarse bags made of material like our bran bags. These bags hold about 2 or 3 lbs. each when tied loosely. Others have a tin vessel like a funnel, with the mouth covered with wire gauze, and are filled through the handle, and answer very well. The bellows is everywhere hung up like poor old Joe's fiddle, as done with and superseded.

The old vines are planted at 6 x 6, and are now grown without stakes, and most of them had been topped before the blooming, no disbudbing or "suckering," as they call it, had been done. I did

not ascertain what kinds are principally grown, but Mr. Krug has a newly planted vineyard of 75 acres over the hills, at an elevation of 1,700 feet, planted mostly to reising, which is here, as everywhere else, considered the best white wine grape.

The implements used to work the vineyard are single-furrow Yankee ploughs; no other would do among the old vines. Scarifiers made to expand, mostly of wood, but some of iron. The tines for a two horse implement are from five to seven, and are made of a diamond-shaped piece of steel, about eight inches long by four broad, slightly bent, and riveted or fastened with a bolt and nut to the standards, so that the plate is almost vertical, and only lying backward very little. This horse-hoe is very effective in ripping up the ground if caked on the surface, as much of the land is liable to, but it is pretty hard on the cattle, and a hoe four feet wide is quite enough for two good light horses. A very good revolving circular iron harrow, five feet diameter, and made of one and a quarter or one and a half inch gaspipe, and with small square tines driven through the piping, fitted with handles and a pole for two horses, is a very effective implement, and is in use pretty generally.

The cellars are very extensive, two stories, all above ground, and cover a space 156 x 130 feet. About one-fourth of the top story is an open balcony over a fermenting cellar, the floor being inclined about two feet to the front and covered with asphalt, so as to be water-tight. Into this balcony the grapes are delivered from the wagons that bring them by elevators made with a stout canvas apron about two feet wide, and the length required from thirty to forty feet, and return. This is fastened to a rubber belt of four inches wide on each margin, and at every two feet is a cross bar of wood two inches square, fastened also at each end, and the whole working over a drum at each end and through a trough, which receives any juice that may fall through. The grapes are brought in boxes holding forty to fifty pounds and are emptied from the wagons on to the apron, and are carried up the incline and delivered into a mill fitted with fluted iron rollers, from which, if for red wine, they fall into the "stemmer," as it is called. This is a shaft studded thickly with spikes about twelve inches long, and set spirally, so as to work the stems towards the opposite end to which the grapes enter. This shaft revolves at a great speed, from 300 to 400 revolutions per minute; in a concave made of stout copper and punched thickly with one-inch holes, and about five feet long. From sixty to seventy tons of grapes can be put through in a day with this apparatus, and if the stemmer is not required the concave can be removed, and the grapes, with the stalk, fall into a sieve, through which a large portion of the juice passes, and the remainder is passed on (always on the incline downwards) into a hydraulic press of

peculiar construction, which is capable of taking three tons of grapes, after some of the juice is gone, at a charge, and two charges an hour can be put through if required. I shall on a future occasion describe more fully this press, which is being adopted by all the foremost men in the winemaking business. Mr. Krug made upwards of 300,000 gallons last vintage from his own and purchased grapes. He pays from \$20 to \$30 a ton of 2,000 lbs.

If for red wine the grapes as they pass from the stemmer are received into small iron dobbins on four wheels and made to turn on a pivot so as to empty in any direction. These when filled are wheeled away and the contents shot through holes in the floor into immense vats below, where the fermentation is carried on. They are fitted with false heads to keep the skins below the surface. When the fermentation is completed the wine is drawn off and pumped with steam pumps into vats set nearly up to the roof, and from them run with hose to any part of the cellars. The skins are then shovelled out into the dobbins and run off to the press, and from the press, after all the wine is got, they are loaded again, and this time run out of the cellar on a high-level bridge to the distillery, about fifty or sixty feet distant, where they are shot on to a close boarded platform over the distilling vats. The distillery contains the engine and boiler which works all the machinery and the distilling. The engine is of 20-horse power, and ample for all requirements. The distillery is fitted up with two stills, one of which is used for the skins and the other for wine. There are to each still two redwood vats of 1,000 gallons each, fitted with a manhole on top for filling, and another of iron near the bottom for emptying. They are heated with a steam coil full of holes at the bottom of each, and one is always being emptied and filled again whilst the other is distilling. They get through from two to four vats a day with each still. The spirit made is reduced to proof, and put into new oak casks of twenty to forty gallons capacity, and bonded or duty paid of 90 cents per gallon proof.

Mr. Krug does his business direct with the Eastern States, keeping five travellers employed all over the country, and the orders are dispatched direct from the cellars, which are well arranged and capable of containing 700,000 gallons, the casks varying from 100 to 3,090 gallons, most of them oval oak casks of 1,200 gallons, and redwood vats from 1,000 to 3,000 gallons.

The whole concern is well arranged for getting through a large quantity of grapes in the least possible time, and as the aim of Mr. Krug is to make a dry wine, the quicker the vintage is over the better in every way for him.

Some further notes on the wines tasted and other matters will be for another paper.

CHAPTER. II.

BERINGA BROTHERS' VINEYARD AND CELLARS.—PRICE OF GRAPES.—FERMENTATION OF THE WINES.—THOMANN'S CELLARS.—ARRANGEMENTS FOR WINE-MAKING AND DISTILLING.—POMACE BRANDY.

AFTER leaving Mr. Charles Krug's St. Helena vineyards we visited that of Messrs. Beringa Brothers, across the road from Mr. Krug's. They have a beautiful place at the foot of the hills, and from the cellar a fine view of the upper part of the valley is obtained, Mount St. Helena, over 4,000 feet high, towering up and apparently shutting up the valley in that direction; but it extends for several miles further, and there are vineyards nearly all the way, and many in the smaller valleys among the hills.

Mr. Beringa, one of the proprietors, was busily engaged directing the excavating of a cellar under his two-story dwelling-house, which had been only a few days removed from a distance of 100 yards or so to a more convenient site. They think very little of moving a big house here.

The cellars are very extensive and three stories high, built against the side of a very steep hill, so that the roadway at the back is nearly level with the top-story floor. The cellars are substantially built of stone as far as the top floor, after that of wood, which was added after the cellar was built, the flat wooden roof of the old cellar forming the floor of the top story. At the back of the bottom cellars are others excavated into the hill, which is of a soft granite-looking stone, easily picked, but getting harder after exposure. These cellars are wide and lofty, and for champagne making would be perfection. The floor of the lower cellar is formed of a patent cement flooring, made in slabs of about two feet square and three inches thick, and makes a splendid floor with watertight joints, and costs laid down 25 cents per square foot. It wears as well or better than granite, and is greatly in use in San Francisco for sidewalks.

At the entrance to the lower cellar, which is one of the neatest kept that we have yet seen, is a fine oak vat of 1,500 gallons, with the monogram of the firm surrounded with a wreath of vine and oak leaves and fruit, beautifully carved in bold relief. This cellar is almost wholly stocked with oval oak casks of from 1,000 to 1,500 gallons each, and are used for fermenting or storing, as may be required. The top story is where the grapes are received and crushed. They are drawn up by an elevator and delivered into the crusher, which is set high enough for the four-wheeled dobbins to receive the crushed grapes, if for red wine, and the contents put through the floor into the vats below, a large wooden

funnel of four to five feet in diameter and one foot deep receiving the load from the dabbins. If for white wine the crushed grapes are passed down direct into the presses which are on the second floor.

At the end of the second floor are the distilling vats in a shed lean-to from the end of the main building, and in which also is the engine and boiler of 20-horse power, which drives all the machinery and generates the steam for the distilling. There is also a copper still for rectifying or distilling of wine. The distilling vats are conveniently set to receive from the dabbins the skins for distillation. The pipes from the distilling vats are of copper and about four inches in diameter, and the rectifying column and beekets above are on the same plan as Nitschke's stills. The skin or "pomace" brandy fetches as much as that made from wine from 80 to 100 cents per gallon proof without the duty. Winemakers are not allowed to use their spirit for fortifying their wines without paying duty. As all the wines hereabouts are made dry, and therefore require no added spirit, this is not regarded as any great hardship; but I am curious to know what the southern winemakers think of it, and how they manage to get what spirit they require for making their angelica and other sweet wines.

Beringa Brothers' vineyard is 88 acres in bearing, and 75 newly planted in addition. They purchased last vintage 1,000 tons of grapes from \$25 to \$33 per ton of 2,000 lbs., but they expect in a year or two to be able to purchase at a much lower rate. They do their business principally with the eastern cities, and employ their own salesmen and forward direct to their customers. They aim to make a perfectly dry and well-fermented wine, and to do this are careful to begin as soon as the grapes show from 20 to 22 per cent. of sugar, and then to hurry through as quickly as possible. They found when they allowed their grapes to get riper that the wine was never reliable, and they often got into trouble about it fermenting after it got to their customers.

From here we went to the wine factory of Mr. Thonann, about a mile down the valley. The railway for a considerable distance runs alongside the public road without any fence. There are plenty of stray cows about the road, and they do not get killed. Perhaps they read the notices, "Look out for the Locomotive when the Bell Rings."

Nearly all the vinegrowers about here are of German descent, Mr. Thonann being one. He has extensive cellars and distillery, is not a vinegrower to any extent, but is a large buyer from his neighbours, and even gets grapes from Sacramento or anywhere he can. For the last two years the growers demand cash on delivery. That is owing to the great demand and increased prices

offered by the buyers. The price paid last vintage was from \$28 to \$33 per ton.

Mr. Thonann's cellars are all of wood and all above ground. The portion of them where the wine is made is of two stories, and the grapes are carried up an elevator in the boxes in which they are brought in, and which for convenience are all of one size, being about the size and shape of a brandy case. From the elevator a man takes the cases as they arrive at the top and empties them into the crusher, and sends the empty boxes down a slide through another window. Thonann says his is a much cleaner way than sending up the grapes by the endless apron as Krug and others do.

The floor is so well put together as to be like the deck of a ship, and if grapes come in too fast, rather than keep his patrons waiting the grapes are emptied into heaps on the floor until they can be crushed.

The mill and separator is the same as Krug and Beringa's, and the grapes are taken along a platform about two and a half feet below the edges of a double row of vats just right for tilting the dabbins into the vats. The vats are all of redwood, and can be headed up if required for storing the wine after it is fermented. The fermentation of red wine is all begun in the vats without the false heads, and when the violent fermentation is over the false heads are put in and blocked down from the groove. The vats are wide and shallow, not over four feet in depth. Mr. Thonann is of opinion that the fermentation is better than in deeper vats; the head is also easier put down when required than in deeper vessels. The juice for white wine is put at once into vats headed up or casks, and fermented, but not allowed to work over. As the contents recede they are kept filled up and racked off in December and January, and the red wines are served in the same way.

Mr. Thonann's distillery, which is only a short distance from the cellar, is fitted with stills for distilling the pomace, and the motive power is got from a good-sized boiler; and from the cellar to the distillery is a double row of vats, which are used when a rush of grapes comes in more than can be accommodated in the building. The vats which were not filled with wine at the last vintage are now filled with linewater, which is changed once or twice during the season. About a bushel of lime to a vat is found to be enough to keep the water from going bad.

At all the vineyards I have visited here they have water laid on from reservoirs in the hills, some public and some private property, and this is so great a convenience that they go to very considerable expense to get it laid on.

Mr. Thonann's place is well arranged for getting over work quickly, with plenty of room about for wagons. A weighbridge

stands at the bottom of the elevator, so that every load is weighed as it comes in to be unloaded, and the tare taken before it leaves the place. The wines are all sold to merchants in San Francisco, and there is no wine over a year old in the cellars. Brandy is all put into new kegs of twenty gallons and casks of thirty and forty gallons of our measure. The American gallon is about five bottles, as far as I can learn; therefore in all cases a fifth must be deducted when gallons are spoken of in my reports.

Brandy fetches from 70 cents to 90 cents per gallon proof, and it is all reduced to proof. The pomace brandy is preferred in the East by the liquor connoisseurs, who find they can flavour nineteen gallons of corn spirit with one of pomace brandy. I think it would be difficult to find a market for such an article in Australia.

I have not yet said anything about the wines tasted at the vineyards, and shall reserve my remarks on them until I have seen them in all parts of the State that we visit

CHAPTER III.

MR. W. SCHEFFLER'S VINEYARD AND DISTILLERY. — IMMENSE CROPS OF GRAPES. — FAVOURITE KINDS GROWN. — SONOMA VALLEY. — HIAZUTU'S VINEYARD. — PHYLOXERA. — WINKLER'S AND DRESSEL'S CELLARS.

WE next visited the vineyard of Mr. W. Scheffler, about a mile west from Mr. Thomann's. The road lay through an almond grove, kept in splendid order and bearing abundantly. Mr. Scheffler's place is beautifully situated at the foot of hills, and a splendid view is obtained from his residence. His vines are planted on the slopes of the hills on reddish soil, and consist of about 100 acres in bearing and another 100 rented from other people; he is also a buyer of grapes for wine-making. The wine-house is large and lofty and of one story, and furnished with six rows of vats of 1,000 gallons each, with three broad roadways between them, and doors at each end of the roadways, so that loads of grapes can pass right through the building.

Mr. Scheffler has a different system of making red wine from any others I have seen. The grapes are put into the vats without crushing, and fermented about ten days, when the wine is drawn off, and water put on the skins instead of pressing them,

and then when drawn off is distilled, and the skins also put through the still. The white wines are crushed by hand mills placed over vats; a powerful Boomer press is used to press off the white skins. The skins are all carted from the wine-house to the distillery, which is some distance away, and emptied into a large shallow tank, and from thence carried up by an elevator-band into the distilling vats, and water put with them to facilitate the boiling, which is done here as at the other places, with a coil full of holes near the bottom of the vats.

When the distillation is completed the door at the bottom is opened, and the force of the steam in the vat is sufficient to drive out all the contents of the vats into a shallow tank, the liquid part is allowed to drain away, and the skins are carted out for manure. The rectifying still is of a peculiar construction, and made to distill in vacuo. It is claimed that a better spirit can be got in this way, as it can be run off at a lower temperature. I do not quite understand the principle, but I tasted some very excellent brandy made with it. I think Mr. Scheffler said it was the only one of the kind in the State. Mr. Scheffler's cellars are rather small compared to some others, but cool, being underground or partially so; they are well filled with the usual oval oak casks of about 1,500 gallons each, besides casks of 150 gallons and smaller for the transportation of wine, and are neatly and cleanly kept.

I noticed in the warehouse some rope made on purpose for tying vines, apparently a coarse manilla, and done up in lakes of 100 lbs.; also sulphur matches for cellar use, which are bought by weight ready made. They are much thicker than those we use and make ourselves.

These were all the vineyards we had time to visit in Napa, which is undoubtedly a favorable spot, and nowhere have I seen vines look better. There are now between eleven and twelve thousand acres planted with vines in the valley, over four thousand acres of which were planted last season. The yield on the rich bottom land from young and healthy vines is almost fabulous. Mr. Krug's distiller told me that one of the farmers who brought in grapes last vintage had close on fourteen tons to the acre from six acres, and from five to six tens is not thought at all extraordinary, but I do not think they are getting quantity and quality both there, any more than elsewhere. I find a very marked difference in the wines made from grapes grown on the hill-sides and those of the plains, and the principal men also recognise it, and are now planting largely the hill sides, which are admirably adapted for vines where not too steep, as the soil is a reddish loam, full of stone, but no lime that I could see in any part of the valley.

The flats are very liable to frost, and the last year's crop was very materially reduced from that cause. The hill sides are almost exempt from it. The annual rainfall is good, and averages twenty-six inches, and in addition they have cool and damp nights from the fogs drifting over from the sea during the summer months, the same as they get in San Francisco, so that even if they have very little rain, anything like a failure of the crops is a thing unknown. Land in the valley suitable for vineyards is very high in price at present, and some has been sold near the town at \$200 (or £40) per acre, and vineyards in bearing as much as \$800 per acre.

There seems to be a great difference of opinion among the growers as to the best kinds to plant. The Zinfandel, a Hungarian grape, seems to be the favorite for red wine, and makes a light clarety wine, and would be an acquisition to us in Australia if we could get it without the risk of the phylloxera. A great many of the older vineyards are planted with the Mission grape, which was introduced here by the Jesuit Fathers over 100 years ago. It is an excellent bearer, and very hardy, and they do not seem in any hurry to get rid of it, although some are grafting them to other kinds. I am told that the bunch and berry are like our Grand Turk, and the leaf and growth of the vine is much like it, but the skin is very thin, and it is considered an excellent table grape. It is said to have been brought from Spain. Among the white grapes the Reisling, of which there are several kinds, are considered the best. Next to them is the Gutedel, or Chasselas, and several others. I have no doubt this is the country to grow the finest clarets and reislings; also a large quantity of cheap white and red wine can be produced here to great advantage, when a market is well opened up for it. The great facilities for sending it away at a little cost by rail and steamer, the easy working nature of the land, and the enormous crops ensure that, if phylloxera does not come in the way. I am told that it is found in several places in the valley, but is not thought to be spreading fast, and very few seem to care much about it in this valley, and go on planting in spite of it.

Some are grafting the Lenoir, an American vine from Missouri, which is said to give a good wine of very high colour, and to be proof against the phylloxera. The reason given for grafting this kind on the Mission vine is to be able to get a large number of cuttings in a short time, as there is a great demand for them from all parts. The cultivation generally is very thorough, and costs from £5 to £8 an acre. They are all planted so that they can be worked with the plough and scarifier both ways. The labour in the vineyards is mostly done by Chinamen, whose wages are a dollar a day. They are also employed in some of the cellars on account of their not drinking and general steadiness and adapta-

tion for the work. Pruning is mostly done with the shears instead of the knife, and generally by daywork. Many are still planting at close distances—6 feet by 6 feet, and a row of maize is often grown the first year between the rows of vines.

The next place visited was the Sonoma Valley, which runs nearly parallel with Napa to the westward, a moderately high range of hills separating the two valleys. We called on Mr. E. Harazthy, son of the late Mr. A. Harazthy, who did a great deal to foster vinegrowing in California. He at one time owned the Bonna Vista vineyards at the foot of hills on the western side of the valley, a view of which is given in his book on the vines of Europe. They were 600 acres in extent, with splendid cellars and residence, but now are nearly all gone to ruin, the phylloxera having made great ravages among the vines eight or ten years ago. I believe this was the first place where it was observed. Mr. E. Harazthy's residence is on the flat, his vineyards are not extensive, but he has a large cellar, and is a purchaser of grapes. He says that himself and others are planting again in the old ground, where the vines have been destroyed by the phylloxera, and they believe that by the use of a compost made with stable manure, mixed with lime and gypsum in the proportion of 300 each of the two to 1,400 parts of horse manure, that the vines will withstand the phylloxera. He has tried it now for three years, and found it succeed, and has great faith in it; but I am inclined to doubt it, and think it a great piece of folly to attempt to plant again in the way they are doing.

He says that fully one-fifth of the old vines in the valley are already destroyed, and that there is hardly a vineyard free from it, but it takes from five to ten years to destroy a vineyard, and they calculate on getting enough to pay them in spite of it, and, strangely enough to me, that land is worth as much as it is in Napa. Some of the valley land is of too strong a clay for vineyards, as it is difficult to work, and bakes into hard lumps in the summer. Fruit-trees of all kinds are grown to supply the city demand. Peaches are very much troubled with the bladder, and apricots and pears are blighted as bad or worse than ours.

Passing the old vineyards of Bonna Vista, which have a sad and disheartening appearance after seeing the luxuriant Napa Valley, we came to the vineyard of Mr. Winkler, one of the oldest vigneron in the district. His vines are partly on the hill sides, and consequently the wines are of a better quality. He is planting the Lenoir grape where the old vines have been destroyed. He showed us some very good young Zinfandel wine; his cellars are pretty old, and apparatus not quite so modern as some we have seen. He uses a hydraulic jack to press with, but does not recommend it.

Adjoining Mr. Winkler's is the cellars and vineyard of Mr.

Dressel. Mr. Dressel, jun., was getting off a large parcel of wine for the Eastern States, where they sell their wines, but say that they have a hard fight in competition with the merchants of San Francisco. They are sending away wine of the last vintage, and filtering it as it is filled into the casks. The white wines are fermented in 150 gallon casks, and kept filled up. They rack-off in December and then sulphur, but are careful not to use any during the fermentation, as it retards that process, and their object is to get as thorough a fermentation as possible. At the first racking the casks are piled one on the other three deep. They are now (18th June) racking the second time, what is not going away, and blending it in a 4,000 open vat set high up, so that it can be run from it to any part of the cellar. Red wines are kept in casks of 1,500 gallons.

Mr. Dressel kindly showed us various wines, especially some from the new wine and up to six years old, made from the Mission grape. The oldest resembled a good Verdelho, with a sherry flavour, and shows that from some land the Mission grape is a better one than some would have it to be. Reising very good, (labeled fair, also a white wine from the juice of the Zinfandel, rather full of acid, reminding one of the wine made at Gawler Park from the Pinet. Mr. Dressel's cellars are pretty extensive, and a large quantity of wine and brandy are made from their own and purchased grapes.

Immediately adjoining is the vineyards and cellars of Messrs. Gundlach & Co., who have a large business in San Francisco. The foreman was away looking after some hay work, and two old Chinamen in the cellar, in answer to some questions, replied, "No savee," so we did not get much information. We saw that they are putting down a large hydraulic press and steam-pump in a shed outside the cellar. Some Chinamen were engaged in "suckering" in the vineyard, and sulphuring after. The old vines here are trained very high, some of them two and a half to three feet in the stem, but they are not doing it now with the young vines, but growing them low.

CHAPTER IV.

SONOMA.—ADOBE HOUSES.—MR. CADY'S CELLARS.—GLEN ELLEN.—FAVOURITE RESORT FOR CITY PEOPLE.—FISH-BREEDING ESTABLISHMENT.—CHAUVEL'S CELLARS.—GOOD WINE FROM THE HILLS.

FROM Gundlach's we returned through the town of Sonoma, which has an old and dilapidated appearance, as though it had seen better days. Most of the old buildings are of "adobes," or sun-dried bricks, made about 9 x 18 and 4 1/2 inches deep. They

appear to stand the weather well, and if the walls are well footed with stone and the roofs kept good will last for any length of time. In the centre of the town is a large covered pavilion in the middle of a square planted with trees. This is used for various purposes—on Sunday's excursion trains from the city bring hundreds of people, and they use it for a picnic ground, dancing, music, and public meetings. Fourth of July orations, &c. Following up the valley, which becomes narrower and more stony as we proceed up the winding roads, crossing creeks full of the wild vine of California, climbing up the highest trees, we first called at the new cellars and distillery of Mr. Cady, who very courteously showed us all we wanted to see. His cellars, &c., are small compared to some we have seen, but are very substantially built of stone and exceedingly well arranged, the collars being built against the hill. The grapes are taken in on the top floor, and crushed with a hand-mill and separator worked by two men, and capable of putting through two tons in an hour.

Mr. Cady having a name for his wines, and which he undoubtedly deserves, has a family trade which takes most of his growth, and a portion of the cellars is devoted to office and bottling departments. We tasted the finest Reising here of the last vintage yet seen; also Zinfandel claret very good. An attempt to make sweet Muscat was not a success, being too thin and spirituous. Mr. Cady's vineyards are all among the hillsides, and none in the valley. He uses one of the hydraulic jack presses, and finds it sufficient for his purpose. The distillery is on the same plan as the others I have described for distilling the pomace, and when there is too much of it to get through he has it put into some old vats, and well trod in and covered with earth to prevent acidity until it can be operated upon. The wines are all bottled in Californian-made bottles of a shape designed by Mr. Cady, and with his brand on each, and of a light-red colour. They cost about \$8 1/2 per gross; clean French clarets cost \$9 per gross, but mixed bottles can be bought for very much less. Bottling, capsuling, labelling, and casing up is done as neatly as any I have seen. Called next at Sevenoaks Vineyards, belonging to Mrs. Warfield, who conducts a large business herself. Her vineyards are all on the hillsides; the cellars and apparatus much as we found elsewhere, including the new steam crusher and separator, &c. The proprietress being away we could not get much information from the old Chinaman, who was the only man about the cellars.

This is close on the station named Glen Ellen, and the terminus of this railway, and is a favourite resort for the San Francisco people on Sunday and holidays, and they could not have a more beautiful place to go to for outdoor worship. The clear sparkling brook rippling over the pebbles, and shaded with trees as thick as

they can grow and festooned with wild vines, deep pools full of fish, and smiling vineyards and orchards in all directions, and all this—including a ride of one and a half hours across the beautiful bay of San Francisco—for \$1½, including return. Most of the people, especially family parties, take their lunch baskets with them and make a day of it. Across the creek and up a pretty rugged road for one and a half miles is a large fish-breeding establishment, owned now by a company, and managed by the former owner, Mr. Lamont. Saw salmon, trout, and carp here in all stages; one pond of trout would average 3 lb. each fish. The ponds are puddled and lined with boards and asphalted, and all covered at about six feet high with loose boards during the summer, and which are removed in the winter. The hatching-room is fitted up with troughs covered with wire-gauze lids. As the young fish got large enough they are transferred to other troughs. In one trough were thousands of lively little trout about an inch in length, and in others larger and larger. They are fed several times a day with chopped liver, which is prepared by a machine driven by the water.

The fish are caught with nets as required, and sent to San Francisco, and fetch 50 cents per pound. They are taken by the large hotels and restaurants. They have also a frog-breeding pond or ponds, but we had not time to see them. The water for the whole concern is taken from the creek and brought round in wooden "flumes," and falls into the ponds from a considerable height, and so keeping the water in constant motion. I could not ascertain whether it is a paying concern or not, as the manager was away, but it is certainly a very interesting one. On our return visited the cellar of Mr. J. Chauvel, a Frenchman from the Champagne country, but who has been in California for over thirty years. He has a splendid new stone-built cellar, which cost \$25,000, and has it built against the hill at the back, and facing the creek in the front. From the front cellar door a bridge of 200 feet or more in length, and from forty to fifty feet above the bed of the creek, carries a line of rails fitted with a truck, which takes two pipes of wine at a time across to a siding of the railway on the opposite side. A fall of six inches in this distance enables the truck to be run with the least possible trouble, and sixty pipes of wine a day can be loaded and dispatched if required. The cellar is of three stories, and the grapes are taken in at the back from the first flat, and passed up into the top story by one of the endless band elevators, and delivered right into the crusher, which is driven by a 10-horse power vertical engine set on this floor on a bottom of bricks.

Under the crusher is a wire sieve, which lets the juice drain off and delivers the skins into trucks, which are run along the floor and "dumped" through holes in the floor into vats below or

into the presses, which are at present the hydraulic jack ones, but it is intended to have a proper hydraulic press in time for the vintage. There is a Fairbank's weighbridge handy to the unloading place for weighing grapes as they come in. Mr. Chauvel is a large buyer of the grapes grown in this upper part of the valley, and paid last year from \$26 to \$33 per ton for them.

The second story, or fermenting-room, is well filled with vats for storing or fermenting in, but the bulk of the white wine is fermented in 150-gallon casks, and kept well filled up, and so continued every fortnight after the fermentation is over.

The red wine is all fermented with false heads to keep down the skins, and where there is no groove in the vat a couple of clamps are fixed under the last hoop, and project three or four inches above the chime; a bar of 3 or 4 by 4 wood is put through them, and the head propped down from this cross-piece. M. Chauvel, who is a jolly old Frenchman, gave us all the information we asked, and volunteered a good deal more. He says that he can always get his wine thoroughly fermented, even when as high as 13 of Beaume; but attaches great importance to beginning soon enough and getting over the vintage quickly, so as not to let the grapes get too ripe. In former times they were often troubled with their over-ripe grapes making a badly-fermented wine, but now that seldom happens. I did not see a single white wine but what was in excellent condition. Mr. Chauvel very kindly took samples from any cask I liked to ask him to. New casks are scalded with boiling water first, and then filled if possible with cold water, and left for a few days with it in them. A little soda in the boiling water is considered to be an improvement.

I tasted some very excellent wines here, and Mr. Chauvel has no difficulty in selling to one firm in this city all he can make at a paying price, and all of it delivered before the next vintage. The distillery is old and some distance away from the new cellar, and there was nothing about it worth while describing.

The new cellars and all about them are the best designed of any yet seen, and everything kept in capital order. The situation of the place is very unique, the banks of the creek here narrowing in together, and are very steep and deep, so that a good deal of excavating and filling has had to be done to make room for such an extensive building and to give access to it both back and front. The hills in this upper part of Sonoma Valley are being extensively planted. Some of the large wine merchants in the city

have gone in for planting on a large scale. I do not think that the phylloxera has yet reached these parts; at any rate, the vines showed no signs of it, and are here all well cultivated.

CHAPTER V.

HARAZTHY'S CHAMPAGNE CELLARS.—PROCESSES USED IN CHAMPAGNE MANUFACTURE.—LACHMAN CELLARS.—LACHMAN AND JACOB'S CELLARS.—SHERRY MAKING.—DREYFUS AND CO.'S CELLARS.—GUNDLACH AND CO.'S CELLARS.—KOHLER AND FROILING'S CELLARS.—OLDEST IN THE CITY.—REDWOOD VATS.

IN previous letters I have described what we saw of the vineyards north of San Francisco, and before giving our experiences of the southern vineyards of Fresno and Los Angeles and the raisin vineyards of the Sacramento Valley a short account of some of the principal wine-cellars in the city of San Francisco will, I trust, be of interest to many, as seeing them has been to us.

The first visited was the cellars of A. Harazthy & Co., in Washington, and to give some idea of their extent I got the area of them from Mr. Harazthy himself. Below ground the principal cellars cover 250 x 137, and across a right-of-way, and got at by a tunnel under the street are two others—one 125 x 197, and a smaller one of 20 x 137. Above ground are three stories, each 125 x 137, and offices, &c., facing Washington-street, 85 x 25. There is also a yard across the street or right-of-way, where several coopers and bottle-washers are employed. The principal part of the cellars below ground and the second-floor above are devoted to champagne making, which is carried on on a large scale, there being always 500,000 bottles in stock and in process of manufacture, and in one cellar on the ground-floor are twenty-eight oval casks of from 2,500 to 3,500 gallons each, all of oak, containing mostly dry wines. In the cellar is an immense blending tank made of three-inch redwood and strongly bolted together, and containing 15,000 gallons, and the wine is operated on by three sets of beaters revolving at from forty to eighty revolutions per minute, and driven by steam. The joints of this tank are perfectly wine-tight, and this is effected by using a cement or luting consisting of twelve pounds clean mutton tallow, two pounds of white lead, and half a gallon of glycerine well mixed together.

It is intended to put up some very large vats on the top-floor, and to pump up the wine, after blending, into them, and from them to run it off to any part of the cellars required. The wine for champagne is bottled at about six months old, and put in stacks in the second story above, and stoves keep this room at a required temperature to bring on the wine. When the breakage becomes considerable it is lowered down into the cellars, and after remaining some time in piles is treated to get the sediment down into the neck of the bottles, by placing the bottles in racks of a peculiar construction neck downwards. The rack is an invention of Mr. Harazthy's, and he has it patented in the States. It takes six months to get the deposit down, and each bottle has to be handled many times before this result is obtained. The next process is the most difficult of all, and must be done by well-trained hands, and that is the disgorging, which is done by removing the cork and allowing the wine to drive out the sediment, and it is then dosed with the required amount of syrup, and refilled and corked, and is now ready for sale as soon as capsuled, labelled, and cased. Messrs. Harazthy & Co. make several qualities of champagne, the "Eclipse," selling for \$12 to \$15 per dozen, to inferior quality at \$8.

Mr. Harazthy was taken to France by his father when a young man, and remained in the champagne cellars for some years to learn the business. He claims that his champagne is an almost pure article; that nothing is used but the small quantity of sugar for sweetening, and that is reduced lately to a minimum by blending sweeter wines. The strength of the "Eclipse" is 11 of alcohol, or 19 per cent. proof. I tasted some of this brand, and found it clean and good, but too sweet for my palate; but no doubt they know the taste of their customers, and, if one may judge from the number of candy shops and the way sweets are used in the city, nothing can be too sweet for the majority of the people. The bottles used are mostly second-hand ones, imported in crates from Liverpool, and are all washed on the premises. Most of the work is done by Chinamen, who get a dollar a day, but are overlooked generally by white men. About seventy are employed altogether.

Harazthy & Co. also do a large trade in dry and sweet wines, and have a stock of 500,000 gallons in the cellars, besides that under treatment for champagne.

The cellars of S. Tachman, in Market-street, in the heart of the city, are some of the oldest and most extensive, and every kind of wine and brandy is to be had here. The stock of wines here and in other cellars is said to be a million gallons. (The gallon here is eight pounds, or a fifth less than ours.) There is a blending vat of 2,000 gallons, but not operated on by steam. A large trade is done in shipping to the Eastern States, and I was

shown new red wines sold to go there at 42 cents per gallon, including the wood, which costs at least 6 cents per gallon. It is mostly sent in 100-gallon butts. This wine was being sent away at the time of my visit. I was also shown samples of various wines from bottles, but none from bulk. Some of the sweet wines were very good for their age.

We next saw the cellars of Lachman & Jacobi, in Bryant-street. It is a large two-story building, covering 140 by 160 feet, with cellars under the greater portion, and engine-house and cooperage at the back. The first floor is furnished with rows of splendid oak casks of 3,000 gallons each, and capable of containing 750,000 gallons. In the top story are piles of casks two and three deep, of 100 gallons each. A shipment of 17,000 gallons was being got ready to go by steamer for New York, via Panama, and the footpath in front was almost blocked up with casks and coopers working at shiving-up and making ready. In the cooperage six men were at work putting together puncheons, the staves and heads of which are imported, already prepared, from the State of Indiana. Upstairs, in a close room, are four vats of 7,000 gallons, all heated by a steam coil in each vat. This is the cooking-room, where sherry is made. The heat is kept up to 140° Fahrenheit for three or four months, and in this way they claim to be able to get sherry fit to send out at a little over a year old. I tasted some samples of it, also of port, but neither would hold a candle to our Angaston ports and sherries. They have a sweet, strong, light-coloured wine, made from almost any grape by stopping the fermentation with a heavy dose of spirit. This is called "Angelica," and is a great favourite with the Yankees, and I am told also with the niggers down South, who are many of them now able to indulge in wine and other luxuries. I sampled some very fair young Reisling and Zinfandel, but I begin to suspect that a great deal of wine is sold as Zinfandel which has very little of that grape in it. The strength of it was said to be 12° alcohol, or 21° proof. Common white wine, dry, and of the last vintage, is now being sent away to the East at 42½ cents per gallon in the wood. Freights are now from 12 cents to 14 cents right through to New York by either steam or rail. It takes about sixteen days going by rail, and more than half of the wine and brandy goes that way now.

We next visited the cellars of Dreyfus & Co., in Fifth-street, a very large two-story building, without any cellars below. The first floor all filled with ovals, all of oak, and mostly 2,500 gallons each. One cask on the left as we enter the door is the largest oval cask in the city, and is over twenty feet high and fifteen feet in the staves, and contains 12,000 gallons. It is made of four-inch oak, and is decorated in the front with a carving of grapes and vine-leaves. On the top floor are piles and piles of 150-gallon

casks, all filled with white wines of the last vintage. It seems to be the general practice to put the white wines in small bulk where possible, and the red in large casks; these 150-gallon casks are used for shipping away the wines. All new casks are steamed before being used. Dreyfus & Co. have also a sherry baking-house, but it was not in action at the time of our visit. They have large vineyards at Anaheim, near Los Angeles, 500 miles south of San Francisco, and from it they get the sweet and strong wines. They have also extensive vineyards planted, but not yet in bearing, at Glen Ellen, in the Sonoma Valley, and always hold a stock of wine of over a million gallons. They have offices in the heart of the city. Lachman & Jacobi have cellars there also, where they do the small business and office work. In both cellars steam-power is used for all purposes to which it can be applied. All the wine is pumped by steam from either fixed or movable pumps, agitators for blending wine, &c.; and where such large quantities of wine are handled it becomes a necessity to have all these appliances. After a trip into the country we visited the cellars of J. Gundlach & Co., in Second-street, and well in the heart of the city. Their cellars are not so extensive as some, but are well arranged and well kept. They have from 500,000 to 600,000 gallons, and were able to show wines of considerable age; but I suspect or "guess" only in small quantities. A Reisling of 1870 was very fine, and by far the best I have yet seen; also, a Gutedel of 1877, equal in every way to a first-class hock. All their wines are got up in splendid condition, and well capsuled and labelled. They have here, as in several other cellars in the city, a wine-bar, where people come in and pop down their five cents and help themselves to a glass of wine from bottles on the counter; this is called in some places the "sample-room," and I suspect that there is a good deal of sampling done in some of them.

Gundlach & Co. employ a number of coopers making up casks for export from prepared staves, and pay \$1½ for setting-up 100-gallon casks. They are prepared by steaming before being used, and filled with water for a few days, if possible.

The last cellars we visited were those of Messrs. Kohler and Frohling, at the foot of Montgomery-street. This is about the oldest wine-cellar in the city, and we were introduced to them by our old friend Dr. Blandale, whose office is in the immediate neighbourhood. Mr. Kohler, the senior partner, began the wine business here on a small scale in 1856, and from it has grown a very large trade, the firm having vineyards and cellars at Sonoma and Los Angeles, the latter of which I hope to visit. They deal principally in wines and brandies of their own manufacture, and having vineyards both north and south, can supply every kind of wine wanted. This cellar is itself evidence of the way in which

the business has grown, as room after room has been added until after a time another and more extensive cellar had to be found, and now it is far larger than the old one, which, however, appears to be affectionately retained, and most of the bottling is done in it.

The firm have all their export casks made at the vineyards, and sent up to the city filled with wines or brandies, and when emptied the wine casks are drained and sulphured, but not washed. In these cellars they have a number of redwood vats of 2,600 gallons, costing only \$65 set-up in the cellar. They are only two-inch staves, and rather lightly hooped for their size. In the office are some beautifully executed coloured pictures of some of the best known grapes cultivated in California. They were published in the city, but are now out of print, and none to be had. The new cellar of the firm is at the corner of Sutter and Dupont streets, more in the centre of the city, and is all below ground. It covers about 100 x 150 feet, and is filled very closely with rows of oval oak casks of 1,500 gallons each, except one or two rows of very old 500 or 600 gallon ones, imported from Germany by Mr. Kohler, and are ornamented with carving in the old style, and named after large cities, as Rome, Florence, Venice, &c. There is room in this cellar for from 300,000 to 400,000 gals.

We tasted here some of the best light-red wines we met with in any cellar in the city. The Zinfandel gave us more satisfaction than any, being very similar to our own clarets, and not so thin and wiry as many of the red wines we have sampled. We took a few bottles with us for use on the overland journey, and in crossing the Colorado Desert, with the thermometer at 110° in the shade, we found that, mixed with the ice-water, always to be had in the cars, it gave us the best drink we could get, and we shall always think of Kohler's claret, and hope he may rest in heaven for making such good wine to help us through this fiery ordeal. In the absence of Mr. Kohler, sen., who was away to a Vine Congress at Los Angeles, we were very courteously shown everything by his two sons, who, I should say, will be worthy successors of the old pioneer, their father.

CHAPTER VI.

RAISIN MAKING.—MR. C. G. BRIGGS'S "RANCH."—CHINESE LABOUR.—DRYING KILNS.—NOVEL MODE OF IRRIGATION.

HAVING heard that the place to see grapes grown for raisins, and how the manufacture of them is carried on, was in the Sacramento Valley, we took train for Davisville, seventy-six miles from San Francisco. After taking the train at

Oakland, we skirt along the bay for many miles, winding round and round the points of land until we come to the steam ferry-bout, which takes the whole train, engine and all, across the bay. This ferry-boat is a wonder for us; it has four lines of rail, each capable of taking six of their long saloon cars. Our train of four and the engine, standing on one side of the boat, did not seem to list her over a bit. After crossing, the country is mostly in wheat and hay crops, except the lowlands near the river, which carry large numbers of cattle. Harvest and haywork were going on in full swing, the one being close on the heels of the other, and in some cases both going on at the same time. Hay is being drawn into small stacks by large rakes worked by two horses, and is afterwards pressed in bales with a portable press worked by two horses or mules, and the hay either sold or stacked in barns. In the wheat-fields the header is busy in all directions. They take off much more of the straw than I expected, very nearly a half of the length in a moderately high crop; three wagons attend each header to receive the crop and take it away to heaps ready for the threshing machine. I did not see any crops that would go over twenty bushels to the acre. Nearing Davisville the country to the right and left is all vineyards, and all planted at wide distances apart, and carefully cultivated.

Visited the "ranch" of Mr. C. G. Briggs, who is the largest maker of raisins in California. The railway passes through his vines, and the homestead is only a mile from the station. The vineyard is 450 acres, and Mr. Briggs has another of 480 acres at Woodlands, twelve miles distant. Mr. Briggs was away from home, but his son-in-law (Mr. Gould) kindly showed us round. The vines are principally the Muscat Gordo Blanco; and the oldest are only eight years. They are planted 10 x 8, but the younger planting is 10 x 16; they bear from 40 to 50 lb. to the vine, when not injured by any pest; they are neither staked, disbudded, or topped, and no objection is raised to the fruit lying on the ground, as the climate is usually dry all through the time of the grapes ripening. Cuttings are generally planted; the latest idea being to plant cuttings 3 feet long, 2 feet laid horizontally in a trench, and 1 foot brought up, and they are said to do well. Mr. Gould has 158 acres of his own planted in this way, and looking well. Pruning is done with strong shears, having handles about thirty inches long, and the cuttings are bundled up for use by a simple contrivance; they use them for the steam boiler and for other purposes, as wood is scarce in this part.

When the grapes are thoroughly ripe they are gathered and laid on trays about 3 feet by 2 feet 6 inches, made very light, and each holding the crop of one vine as a rule. They remain

out between the rows, and are turned in about seven or eight days by placing an empty tray on a full one and turning both over. I believe I gave them this idea some ten or twelve years ago, as I know that my process of drying was copied from the Adelaide papers into the "Rural Press" of California. In about twelve or fourteen days, according to the weather, the raisins are sufficiently dried, and are shot off the trays into boxes about the same size or a little larger, and deep enough to hold sixteen trays. Paper is put between every four layers, and they are allowed to remain in these "sweating" boxes, as they are called, in the packing-house until wanted. The packing-house is a large and lofty wooden building 230 feet by 90 feet, and the centre was fitted up as drying-kilns last season to try and save some of the crop, as it turned out an unusually wet season. A table 4 feet wide runs the whole length of the building on one side, and the fruit is sorted and packed here into boxes of 5, 10, and 20 lb.; those of 20 lb. are in four layers, those of 10 lb. in two. The boxes are neatly made, and cleaned off with a revolving disc covered with emery paper, and are all of one size, the only difference being in the depth of the box. There are three different grades of raisins boxed besides the loose ones, which are packed in 50 lb. boxes, and sold at 6 cents per lb. The boxes are all made on the place, and another building nearly equal in size to the packing-room contains them and the fruit when packed; and another large shed is full of trays packed away. The quantity turned out in 1881 was 550 tons, but the 1882 crop was reduced to less than half by the grape hopper or thrip and the wet weather. The price got was \$1½ for 20 lb. boxes, and \$1 for 10 lb., and \$2½ for four 5 lb. boxes. Prunes are dried in three "Plummer" driers, heated by fire. They take five or six days in the sun and two days in the kilns, and sell for 15 cents per lb. in small boxes. These and raisins are the only fruits dried. About 250 Chinamen are employed at the raisin-making during October and November. They are overlooked by white men, one to about twenty-five of the yellow-skinned; they get from 80 cents to a dollar a day, and Mr. Briggs is afraid now that they are stopped from coming to the country that he will have great difficulty in carrying on the business.

The soil is a deep sandy alluvium, easily worked. A large portion is irrigated by cement pipes laid between every second row of vines at 20 inches in depth, with a hole for the water to come up through between every four vines. The pipes are made of sixteen parts gravel from the bed of a river to one part of cement, and the machine lays the pipe continuously in the trench as it travels along. Mr. Briggs is not quite satisfied with this system, and thinks that surface irrigation is the best after all. The water is raised with a thirty-six-horsepower portable engine.

The land is all deeply ploughed once in the winter with single-furrow ploughs, and kept well worked with two-horse scarifiers and a pulverizer made with steel knives crossing each other. It is called the "Achme" cultivator, and is found very useful if used at the right time. The cultivation is very thorough, and scarcely a weed is to be seen. There are seven acres of soft-shell almonds, which are expected this year to yield from twenty-five to thirty tons. They got 14½ cents per lb. for the last crop to go to Chicago. There are also several acres of apricot, plum, and pear trees, the produce of which is all sent to the canning factories in San Francisco. The whole establishment is a model of good management. Mr. Briggs travelled through Spain in the autumn of 1878 during the raisin-making season, and saw nothing there to copy, their processes being found by him to be quite unsuitable to a new country, where land is cheap and labour dear, and he came back fully persuaded that he could turn out in California raisins better and cheaper than any country in the world. I had the pleasure of meeting Mr. Briggs in the same train that brought us back to the city, and got many of these particulars from him. He also told me that he had not tried the system of dipping the grapes in boiling lye, the object being to make as many dessert raisins as possible, as they fetch a higher price than pudding raisins. He also said that the kilns he had to put up last year to save a portion of his crop answered very well, and that he could get in twenty tons at a time, and by means of a steam coil in the bottom of each compartment could get up a heat of 130° F., quite sufficient to dry them thoroughly. I saw here a very ingenious contrivance for taking the outer husks from almonds, and which is said to work very well, but I should like to see it at work, as I doubt whether it would not injure the soft-shell kinds. There is no doubt but this part of the country is admirably adapted for raisin-making, the soil being, with the aid of irrigation, capable of producing the finest grapes, and the climate during the ripening nearly dry and free from the fogs and damp of the country nearer the sea. The land requires nothing more than deep ploughing to prepare for planting, and no stakes are used, as the grapes are allowed to lie on the ground, and are considered to ripen earlier than if kept trained higher. Oidium is very seldom seen to do any damage, the only trouble they have is the little vine hopper, which eats away the under side of the first leaves, and causes them to drop and leave bare the fruit, which consequently gets burnt with the sun.

Several kinds of Muscat grapes have been tried. One, under the name of the Cannon Hill Muscat, was found to set badly, but where a few Tokay vines were among them they set better. Mr. Blowers, at Woodlands, is also a large grower of raisins, but

I had not time to visit him, as I should like to have done. A very interesting article by him on raisin-making in the first report of the Viticultural Commission can be found in the library of the Royal Agricultural and Horticultural Society, Adelaide.

CHAPTER VII.

SAN JOSE.—GENERAL H. M. NAGLEE'S BRANDY MANUFACTORY.—
FINE BRANDY FROM THE REISLING GRAPE.—LARGE VATS USED.

HAVING heard that a gentleman at San Jose had devoted much of his time and money to the manufacture of brandy, we determined to pay him a visit. San Jose is about fifty miles south of San Francisco, and is situated in the midst of a very fertile plain, and surrounded with orchards and vineyards. It is not far from the southern end of the Bay of San Francisco. The town is well laid out, the streets being of good width, and nearly all planted with trees on both sides, the Tasmanian gum here having made a wonderful growth. The town is lighted with the electric light. At the intersection of the two principal streets a structure of tubular iron springing from the four corners of the footpaths rises tapering to a point over 100 feet in height, and bearing the light at the top. There are also four or five high masts bearing lights of great power, and the light is considered very satisfactory by the townspeople.

The vineyard, distillery, and cellars of General H. M. Naglee are close to the town. The vineyard is an old one of about fifty acres, and was formerly nearly all Mission grapes; but they have been grafted from time to time, and are now principally brought down to two kinds—Reisling and Burgundy. They are grown particularly high on account of spring frosts. Being old and strong, they do not require much support. Those that do are staked with sawn stakes. The land being apparently a rich black alluvial soil, full of waterworn stones, has given immense yields; as much as nineteen tons to the acre is said to have been gathered from the Mission grape.

The cellars are well-built of stone, and principally of one story, except the part used for crushing and fermenting the grapes and distilling. The grapes are brought in from the vineyard in boxes, and delivered from the wagons through a wide doorway at the end, the ground outside being raised some feet to allow the wagons to rise to the level of the floor. Here they are crushed

by a powerful iron-fluted roller-mill, worked by two men, and fall, stems and all, into vats of 6,000 gallons below, through openings in the floor. There are nine of these vats, all made of redwood, and open at the top.

All the juice that will run off is allowed to do so, and is pumped off into other vats to ferment, and warm water, heated by steam, is then put on the skins, and they are again fermented and the liquor run off, and sometimes a second lot put on; this liquor is made into a second-class brandy. There is no press now used, as it is found that after the second watering and drawing, the skins do not pay for the labour of pressing. A very good and large single-screw French press is therefore lying unused.

As soon as possible after fermentation is over distilling commences. The still, which is apparently a rather complicated arrangement, is a continuous one, and made on a plan given by the General himself. The still is worked by steam, and turns out about 170 gallons a day at about 50 o.p., which is the strength found to answer best. Much more could be run off at a lower strength, but the quality would be injured by the quantity of fusel oil driven over with the spirit.

In a cellar adjoining are two immense vats of 16,000 gallons each, into which the fermented wash is pumped until wanted for distillation.

The spirit after distillation is put into oak casks of 1,500 gallons each in an adjoining cellar, where there are twenty or more of them in two rows, all very strongly made, and the heads prevented from coming outwards by longitudinal timber crossing every three casks both back and front, and kept together with strong iron bolts. As all the heads are put in concave I should say this is quite an unnecessary precaution, but it gives an idea of security. The brandy is left in these casks to age after being reduced to proof with distilled water. No flavouring or colouring is used, the General priding himself on the absolute purity of the article he produces. The price obtained is \$7½ per case, and, considering that nearly \$2 or \$1.80 is paid as duty to the State, and that no brandy is sold under three years, the price seems to be very low indeed.

Brandy is allowed to be kept for three years in bond, after that the duty of 90c. per gallon proof has to be paid.

The thing here of the most interest to us was the different kinds of brandy made from various kinds of grapes, and of different ages up to twelve years.

The finest and most delicate flavoured was a brandy made from the Reisling grape, and twelve years old. This, when compared with other kinds, showed that there is as much difference in the brandy as in the wine it is made from. Next to the Reisling the Burgundy gave the best; after that the Gouais.

Muscat gave a very full-flavoured and heavy spirit, without the delicate bouquet and flavour of the Reisling. Brandy from the Mission grape, from one to twelve years, very good, but not so fine as the Reisling and Burgundy. General Naglee is undecided which is the best grape to plant for brandy. He says if he could get double the price for his Reisling brandy he would plant that kind only; but, as that is not the case, and not likely to be, he would as a paying business go in for the heavy bearing kinds and those easiest to cultivate. I have no doubt that his Muscat brandy would be preferred by most persons, and that giving that made from the Reisling grape would be like throwing pearls before swine to nine-tenths of the people.

Only the best Indiana oak is used for storage casks. A 1,500-vat of brandy made from the Mission grape in 1870, and put into a new redwood cask, had got a slight pine flavour, but was otherwise very good.

There was only one thing which I wished to see here, but did not, and that is the brandy made from the same grapes grown in different soils. Much as General Naglee has already done, his work will not be complete until he can show the influence that soil and situation has upon the product, and I have no doubt, if he is spared a few years more, he will do that also.

It is a good thing for any country to have a few men who make a hobby of special industries. Even if they make mistakes they greatly benefit the country by the experience gained. There are but few who have the pluck to go into ventures like this, and who can, like General Naglee, afford to stand the outlay and wait for years for the return; and if no adequate return does come they have the satisfaction of feeling that they have done more for their country than all the stockjobbers and land schemers ever did or ever will do.

General Naglee's residence is in the old style, but is surrounded by a magnificent park, which he generously throws open to the public on Sundays.

I was sorry not to have had more time to spend in his company, as there were many points I wished to ask his opinion about, and which escaped me at the time; but he very kindly offered to answer any enquiries I might make as far as he could.

The brandy is all sold in bottles made of a special shape for him, and is neatly labelled, capsuled, and cased. It can be got at most of the leading hotels in the country, and is recommended by many of the leading medical men to their patients. We hope to be able to take a sample he kindly gave us back to Australia to show what pure brandy is like.

CHAPTER VIII.

FRESNO. — EISEN'S VINEYARD. — IRRIGATION SYSTEM OF AND WONDERFUL EFFECTS. — WATER-POWER UTILISED. — FRESNO COMPANY'S VINEYARD.—CELLARS BUILT OF "ADOBE."

THE vineyards of Los Angeles being nearly 500 miles south of San Francisco, we determined to take what is called the southern route on our way to the east, taking us through Arizona and New Mexico, and then northward to Chicago, instead of the northern route via Salt Lake and Omaha. On the way we stopped a day at Fresno, which is about 200 miles on the route, and is situated in the midst of the immense plain between the Sierra Nevada and the coast ranges, both of which are seen fearfully the whole way, the snow-topped peaks of the Sierra Nevada showing up occasionally through the dull vapour-laden air. Nearly the whole of this plain is in wheat and other cereals, and makes one feel small in talking of our wheat-fields in South Australia. The whole of this valley is drained by the San Joaquin River and its tributaries. The principal one crossed before reaching Fresno is the King's River, from which water is obtained for irrigating the plains about Fresno. Fresno is quite a new place, but has already 4,000 inhabitants. The streets are laid out wide and regular, and when well planted with trees it will be a very fine city.

We drove out to the vineyard of Mr. Eisen, about four miles towards the Sierra. This is the oldest vineyard in the district, having been started eight years ago. The estate is 640 acres, 300 of which are planted with vines. The proprietor was away to San Francisco, but his superintendent, Mr. Baber, a young Englishman, showed us all we wished to see, and gave us all the information possible about irrigation, which is the life of the district, for without it it is only a sandy waste, destitute of trees or grass, and barren looking in the extreme compared to the portions irrigated. The great feature of this estate—or "ranch," as they are all called, from the Chinaman's five acres to the squatter's 50,000—is the system of irrigation, which was here brought first into use in the district. On the estate was the bed of one of the many creeks which bring the waters of the

mountains across the plain in times of flood. A company took it in hand to build a dam across the King's River, about sixteen miles up the stream, and divert a portion of the water into this channel, which by this means soon became larger and more defined in its course. Mr. Eisen has the advantage of this stream through the middle of his property, and it has so thoroughly saturated the land that water can now be obtained anywhere at a few feet, whereas before they had to sink fifty feet for it. A raised channel, or ditch as it is called, 3 feet deep, 9 feet across at the top, and 3 feet at the bottom, is taken from this main channel at about a mile up the stream, and brought round to the cellars nearly on a level, and is there used to turn a turbine wheel, having a fall of about 4 feet. This power is used for all purposes, such as pumping wine, crushing grapes, grinding corn, pressing cotton, sawing wood, &c. From this channel are smaller ones, following generally the highest ground all over the estate, and the water is turned into them by a very simple arrangement of doors from the main channel. In this way every inch of the land can be irrigated at pleasure. In Eisen's greatest trouble is too much water, as the company occasionally let down too much water in the creek, flooding the vines at the wrong time and destroying the crop of grapes.

The growth of everything here is simply astonishing, and no one can believe it without actually seeing it. Vines planted as cuttings two years ago from February or March have now a good crop of grapes on them, and poplars and other trees in four years are from twenty to thirty feet in height; lucerne, or alfalfa as it is called here, is as good as at the Reedsbeds, and is cut five or six times during the season. Some kinds of trees, however, do not get on—the mulberry, olive, and orange—I suppose from too much water at the root. The cellars are large and of two stories, built of "adobes," or sundried bricks; the top story, which is in the roof, is used only for crushing the grapes, and for all sorts of lumber. The grapes are crushed with iron rollers, and fall on to a large wire riddle, which is shaken by the same power that drives the mill. The grapes and juice fall into a dobbin, which holds about 5 cwt., and is of wood, with a sloping point end. It is tilted by blocking the front wheels and raising the handles behind. These dobbins are run along the floor, and the contents slot down through traps into 1,500-gallon redwood vats below, where it is fermented, and after the wine is drawn off water is put on to both the red and white skins for distillation. We saw no press on the place, and so conclude that they do not use any, but forgot to ask the question.

There are over 100 vats, mostly 1,500 gallons each, and a few of 3,000. We saw a pump at work taking the wine from five vats at one time through an inch hose to each vat, and pumping

it into a blending vat of 3,000 gallons. Here it is stirred with a vertical shaft-stirrer, also worked by the waterpower from the main shaft running right through the cellars. Various kinds of grapes are grown here, and all kinds of wine are attempted to be made—from fairly light wine from the Zinfandel to heavy Muscats and Ports. The most of the Zinfandel runs from thirty to thirty-five by Belling's sacchrometer (the one used here) to forty-five for the Muscat.

Wine has only been made here in any quantity for five years, and as the vines are all young one can hardly say yet what the quality may be in time to come as the vines get older, but at present the wines are not much to boast of. We were shown a red wine of last vintage, made to order with all stalk in it, and fortified up to 40 per cent proof. It is to be used in making Port, and has plenty of fire and roughness, and no doubt they into whose hands it will soon come will be able to add all else that may be required, and turn it out as port by the time it is a year old. We were shown a white wine called sherry, from the Faber Zagos grape, but without any sherry flavour. Scarcely any wines but of the last vintage are in the cellars, and these are being sent away as fast as possible. I am strongly of opinion that the produce of this and similar vineyards will nearly all be made into brandy in a very few years, and will pay better for that than for wine, except it may be sweet wines. Mr. Eisen is a large buyer of grapes, and up to the last year or two had it all his own way, but the presence of other buyers last year raised the price from \$20 to \$30 per ton.

The best wine tasted was a Muscat made from very ripe grapes and duly fortified, and I think by regulating the supply of water that grapes may be ripened here to any extent, and good sweet and heavy wines made. But to try to make clarets and hocks in this hot and dry climate is quite a mistake, and will never be able to compete in quality with the hill wines of the northern counties of California. Fortunately for them they have no phylloxera here yet. Their only trouble is the vine-hopper and thrip, but the growth is so strong as to bid defiance to almost any pest of this kind. From here we drove over the main creek again, and soon came to the property of the Fresno Vineyard Company, managed by Mr. Hudson, a thoroughly practical man, and who, I should judge, is a first-rate manager. He took some pride in astonishing us with a piece of Zinfandel grapes of forty acres, planted two years ago last January as cuttings, and which have now a crop of grapes on them which he estimates at 400 gallons to the acre. No doubt there is 300, and there may be more. Some of the stocks are already as big round as my wrist.

There are 450 acres of vines planted, and all laid out for irrigation; also about 1,000 fruit-trees of various kinds, and which have made extraordinary growth. There are about seven kinds of grapes planted, consisting of Zinfandel, Berger, Charbono, Faher Zagos, Malvoise, Muscat Gordo Blanco, and a few Reising. They are planted at good distances apart, about 10 x 10 and 10 x 8, and staked for two or three years with a short stake about a foot above the ground, just to keep the stem upright; the only ones staked with long stakes are the Reising. The vines are not topped, and already nearly cover all the ground, so that it is not possible to work them with horses. Mr. Hudson, who has had considerable experience in the older vineyards of Los Angeles, prunes the Muscat long so as to prevent colure or bad setting.

Large new cellars are being built and casks getting ready for the vintage, which begins in August in this part of the country. The cellar is all above ground, and built of adobes, in two lays, each about 50 x 120 feet, and each will take four rows of vats of 15,000 gallons, which are being made of redwood, and leave room for two roadways of eight or nine feet each, with doorways at each end of them. The floor is of brick, grouted in with cement, and with gutters on each side of the paths, and the floors under where the vats are to stand have a slight incline towards the gutters. There is no machinery yet on the ground, but the best out is to be put down. A large distillery and boiler-house is built at one end of the cellar at about 40 feet distance. The roofs are all of sawn shingles, which make a much better roof than our split palings. They project about three feet, and so protect the walls to some extent, but the adobes made here seem to stand the weather well; some at Eisen's, eight years up, show very little signs of the action of the weather.

The irrigation scheme on which the prosperity of this part of the country wholly depends, is yet in its infancy, and troubles are already being experienced. Schemes of this kind are started by companies, and after a time get into the hands of one or two persons, who do pretty much as they please with the people who are depending on them for water. The people some miles lower down the rivers are up in arms because the supply of water for their cattle is taken away, and take the law into their own hands, and send bodies of men, 100 or more in number, to destroy the head weirs. In some places too much water is put on the land, and the soakage from it forms marshy spots; other places get too little, and the whole thing wants carefully regulating by law or custom. But there is no doubt about the effect of it, as it can be seen on all sides that it has already caused a howling desert to rejoice and blossom as the rose; but the rose in this case is the

oleander, which is everywhere planted among the poplars around the ditches, and is now in the most luxuriant bloom. We are glad to hear that Mr. Eisen, who may be considered the pioneer hero, has done well, knowing as we do that the first men in new undertakings are often spending their energies for the benefit of others who follow after them.

CHAPTER IX.

RAILWAY TRAVELLING.—DUST AND HEAT.—LOS ANGELES.—KOHLER AND FROHLING'S WINE CELLARS.—ST. GABRIEL WINE COMPANY.—SUPERIOR ARRANGEMENT OF BUILDINGS AND MACHINERY.—ORANGE AND LEMON TREES.—IRRIGATION.

FROM Fresno for some miles the plain extends, and the line for miles is a straight one. The ballast is only the earth out of the trenches, and the train in passing along raises clouds of fine dust, nearly smothering the occupants of the hinder cars. Americans—both men and women—provide themselves with linen garments called "clusters," reaching from the chin to the feet, and every one travelling here during the summer should take the same precaution. During the night the train passes over a very steep incline, and rises 7,000 feet above the level of the sea in crossing the tail end of the Sierra Nevada chain of mountains. It was here where a fearful accident happened lately to a train which got away from the summit station whilst the engine-driver was off his engine, and after being capsized over an embankment caught fire and killed and burnt nearly fifty people, so we were glad to be over this part of the line in safety. From daybreak in the morning until nearly reaching Los Angeles the country is a desert, compared with which the country about Farina is a paradise. After a good rest, which we required, for we got very little rest in the train, as it was a hot night and quite stifling in the berths, we visited the cellars of Kohler and Frohling, in the outskirts of the town. As the manager was not in we took a drive round for a few miles—all the way through orchards, orange groves, and vineyards. The whole of the land is laid out for irrigation, and there is water, water everywhere—in earthen ditches and wooden flumes, crossing the roads and running alongside them, and in some cases driving wheels of twenty feet diameter to raise water into wooden vats for domestic

purposes. The orange and all fruit-trees are trained with a high stem, and generally the land is well cultivated and kept free from weeds. The orange trees generally look very healthy, and of a much darker green in the foliage than they do in New South Wales. We saw some forty-seven years old, and still strong and healthy. The crop is now nearly all gathered and sent all over the country, many of them going eastward even to New York and Philadelphia. The lemons grown here are very fine. Peach-trees looked rather scrubby and the fruit small. Pear-trees generally well loaded, but apples a failure. Returned and found the manager, Mr. Wilhelm Schillings, who kindly showed us round. The vineyard is the oldest in the district, and was planted by Mr. Köhler in 1854. It is only of small extent, and almost wholly of the Mission grape, but large quantities of grapes are bought and made into wine and brandy.

The vineyard is carefully cultivated, and the vines are dis-budded, but not topped. They are trained with very high stems, and the stakes done away with, as is the case in all old vineyards. The cellars are extensive, but detached from one another, having evidently been built as the business increased; the oldest cellar is still standing, and used as a fermenting cellar.

The newest cellar is a fine building of two stories, the lower one being 20 feet high, and the top one 10 or 11. Here are two crushing and separating machines similar to those described at Krug's and other places. These machines are supplied with grapes by an elevator to each, and the crushed grapes and juice fall into a tank 10 x 12 and 2 feet deep, fitted with a strainer in the bottom to allow the juice to flow away. The skins are then passed through a hole in the floor and fall into wooden shoots about 11 inches wide and 9 or 10 deep, so arranged as to deliver into any vat in the lower story by means of stops and outlets. The crushed grapes are also taken overhead across the yard into the old cellars through earthenware pipes 9 inches in diameter, and then on to the vats in open wooden shoots with very little fall, but, they say, quite enough to prevent choking.

In 1880 200,000 gallons of wine and 20,000 gallons of brandy were made; the vintage of 1881 was much less in quantity. Wine of all descriptions is made here. Drank some very fair light-red wine; also tasted sweet wines Port and Angelica, both good, but wanting more age. The manager said that many of the small growers use too much water while the grapes are ripening to increase the weight, and when there is less competition for grapes they will try to buy them according to the weight of the must. Having had late rains this year they have not irrigated their vines at all, and they do not appear to want it, having made good growth. The distillery is adjoining the new cellar, and is fitted with a still of wood 20 feet or over in height and about

4 feet in diameter; this is divided into three chambers in the inside, and there is also a rectifier or "doubler" alongside. They do not distil the skins, but do it all by washing them with water. We did not see a press on the place. They are just now fixing a 20-horsepower boiler, the old one proving too small to do all the work required in the vintage. The fireplace is arranged to burn oil instead of coal or wood, and if anything happens the fire can be put out in a moment by turning a tap. The cooperage is away at some distance, and three men are busy at setting up 40-gallon casks from staves and heads brought from Indiana. They get 55 cents each for this work. They are filled with wine and brandy here, and sent on to the San Francisco cellars of the firm, which have been already described, and they are then used again for sending out the wines to customers all over the country.

Next day took a coach and driver to the large vineyard of Rose and Stern, at St. Gabriel, eight or nine miles from St. Angeles. The country between is rather hilly, but on getting near St. Gabriel the land improves, and many orchards and gardens are passed, nearly all of them open to the road. Some of these are irrigated from artesian wells, but the supply from them is limited compared to that got from the hills. We passed several of them. The water is delivered through a six-inch pipe some eight or nine feet above the ground, and falls over into a reservoir. It looks as if it was as clear as crystal and as cold as ice as it flows over the bell-mouth of the pipe. Noticed one that had failed from some cause or another. I noticed that they were watering the orange-trees, all done by Chinamen. They raise a bank between each tree and fill the same with water, which comes from the Sierra Madre Mountains, about four or five miles distant to the foot of them. They profess to water the trees every month during the summer. On our return passed through the village of St. Gabriel and by the old Mission House built by the Jesuits 140 years ago. It is still used, a new roof having been put on a few years ago. About here are a few old adobe buildings, occupied by the remnant of the Mexican people, who are to be seen lying round or propping up the few trees growing about their dwellings. No cultivation or anything but a few old horses—high in bone but low in flesh—tethered or hobbled about. In strange contrast is the flash-looking Yankee beer-saloons and drug stores near them. Returning by another route we came upon the splendid cellars of the San Gabriel Wine Company—a new concern. The wine-house is an immense building of two stories, built of brick made on the place, and is 266 feet long by 186 feet wide. The lower story is 13 feet high, and the top 11, as near as could be judged. This is built on the top of a chalk hill, which was levelled off, and the material used to make a

roadway to ascend to the back of the building for the delivery of the grapes. The crushers are two in number, and placed at a distance of one-fourth from each end in transverse roofs made for them above the level of the ceiling joists. The grapes are put into one end of a cylinder, on which are revolving beaters, set specially to carry the grapes forward to the other end, where they fall into a wire cylinder, also revolving, but at a low speed, which separates the stalk, and delivers them out at the end. The skins and juice then pass into wooden shoots arranged with a fall of 4 feet in 30 to all parts of the building, and to every vat in it. About half of the bottom floor is already furnished with fermenting vats, of 3,000 gallons each; from them the wine, after fermentation, is run off to the cellar through a four-inch galvanized iron pipe. This cellar is about 400 or 500 yards distant, and the top of it is below the level of the bottom of the winehouse. The pipe is carried across on trestles 40 or 50 feet high, and delivers the wine into a tank raised on a platform on the top floor, and from that with hose to any part of the cellar, which is 215 feet long by 186 wide. Already the cellar has, on the bottom floor, 50 oval casks of 1,500 gallons each, all full, and a lot of smaller casks stacked about. A branch from the Great Southern Railway is brought in past the cellar, and another to the distillery, which is also built at the foot of the hill, on which the winehouse stands, and is fitted with four stills of the best kind, so arranged that one man can attend to the lot. This building also contains the boilers which supply steam for the stills, and also through a pipe several hundred feet up the hill, and to a crushing apparatus in the winehouse. The skins of the grapes, after the wine is drawn off, are treated with water, and that after fermented is drawn off into a tank in the middle of the winehouse, from which iron pipes convey it to the top of the distillery. I find that no officer is set by the Government to watch the distillery, but every distiller is required to declare on oath how much he has distilled. The skins, after the water is drawn off, are thrown out of the vats into iron trucks, which run on rails laid all through the building, and through a tunnel cut in the rock at the back, and are shot out over a stage and down the hill. The grapes are all brought up to the top of the hill, which is levelled off to make room for thirty or forty wagons, and high enough, so that the boxes of grapes can be handed out of the wagons into the crushers. In this arrangement no elevators are required. From this platform a splendid view of the estate and the San Gabriel Valley is obtained, and when the whole estate of 1,600 acres is planted, as is intended, it will be a pretty panorama. Already they have 200 acres planted and doing well without irrigation. They do not intend to resort to that if they can avoid it. They have planted cuttings of Mataro, Carignan,

and Grenache, and other good French kinds 14 or 15 inches in the ground in holes dug with the post-hole digger, and well rammed at the bottom. The land before planting looks very barren, and full of hills and hollows, like our Bay of Biscay land. This is levelled with earthscoops before planting. The land is trench-ploughed 15 inches deep, which I consider quite useless, as the soil seems to be a gravelly sand with no clay, as far as I could see in the water washes about the place. The planting is rather close, I think—6 feet x 6 feet—but I am not quite sure about the distance. The secretary and manager were away at the time of my visit, but an old soldier attached to the Customs or Distillery Department took us round, and I afterwards saw the secretary, Mr. Fred. Wood, in Los Angeles, and he kindly gave me much information. Mr. Wood was the architect of the whole concern, and the arrangement of it all is at the top of everything we have yet seen, and reflects infinite credit on that gentleman. Mr. Walker is manager, and Dr. de Barth Short president of the company, who only commenced operations in May, 1882, and in September had the place ready to receive grapes and make wine. The whole of the bricks and lime were burnt on the place, and everything appears to be done to stand, and no cracks or faults are to be found in any of the buildings. No fencing is done, as the law allows damages to be claimed for trespass on other lands. We shall be glad to hear of this spirited undertaking succeeding well, both for the shareholders and the country at large.

CHAPTER X.

THE FUTURE OF WINE-GROWING IN CALIFORNIA AND AUSTRALIA.

MY last letter completed the description of all I have seen of the vineyards and cellars of California during a stay of twenty days. Of course it would take months to visit all, but I think I have seen the principal *old* vineyards in the country. There may be a few errors in my letters in respect of numbers and quantities—I took no notes at the time of my visit—but as I had two pairs of eyes and ears with me beside my own, and we generally compared notes when in the evening I jotted down the events of the day, I trust there is not much wrong in what I have written. I have come to the conclusion

that there is a great future before the vine-growers and wine-makers of California. They can produce every class of wine required by the world in some part or another of the country. They can make good brandy, and as cheaply as any country, from the immense yields of grapes and the use of labour-saving machinery in cultivation and manufacture. The fine land of the interior valley of the Sacramento and the San Joaquin, with the aid of irrigation judiciously applied, and the fine dry climate, will enable them to supply all the world with raisins, and perhaps currants, which, strangely enough, have hardly been tried as yet. They have a population of over fifty millions of people in the United States alone to supply, and railway rates are now at a rate that will enable them to flood the eastern markets with wine and brandy. There are already ten million gallons of wine made in California from the best accounts I could gather, and from the large increase in planting during the past few years, and still going on, the production will be doubled in three years, and it is quite possible that production will for a time be in excess of the demand; and, for the credit of the wines of California, the sooner that is brought about the better, as the wines now are placed on the market much too young, especially for the sweet and strong wines. We shall very likely hear of a great depression and low prices in consequence of this rush in vine-planting, but it will be only for a time, and those who have good vineyards, and can make fairly good wine need not fear, for it will soon pass away. The market for the wines in the country itself is not yet half developed; there are hardly any places open to the public in any of the cities for the sale of wines only; it is generally mixed up with lager-beer and spirits, and very little attention paid to serving it out in a proper manner. A great deal of it is no doubt sold as French and German wines, the labels, brands, and cases being imitated to a T.

The wholesale business in wines and brandies in San Francisco is principally in the hands of Jews, and no doubt when the price gets low enough for them they will buy in largely and hold for age and better prices. Now one scarcely finds any quantity of wine over a year old in any grower's cellar, and I do not think there is much in those of merchants.

For us in Australia we have nothing to fear from the competition of Californian wines with ours in Europe. They have too large a market of their own to supply for many years to come; and our wines are of a quality to suit the London market much better than any I have seen of theirs. The youth of most of their vines is a cause of much inferior wine being made; add to this the very general habit of planting vines in land too rich to give anything but poor wine, even from the best kinds of grapes. That the country is capable of producing fine wines I have no

doubt, having tasted excellent old wines, and very promising new wines made from old hillside vineyards.

I have obtained during my visit greatly enlarged views of what we should be able to do in Australia in the production of wine and in the economical working of vineyards and cellars; many hints which will, I trust, be of some service to the country of my adoption, and to myself and family. As I purpose to visit some of the vineyards on the islands in Lake Erie, where the famed Catawba wine is made, I may be able to give an account of them at a future period.

CHAPTER XI.

VINEYARDS ON LAKE ERIE.—KELLY ISLAND.—HIGH PRICE OF GRAPES.—CATAWBA WINES.—GALILIZED WINES.—SHAM AND HUMBUG IN THE WINE TRADE.

AFTER leaving California we passed through the State of Arizona, and on the Rio Grande River saw the Mexican villages and their mode of cultivation. The Mexicans are early birds, for we saw many of them out turning the water into the crops at day-break. The only cultivation is alongside the river. The vast treeless plains, covered here and there with the gigantic cactus and the yucca, now in bloom, are almost destitute of life of any kind, and we were glad to get into a better country, which we did in Kansas, and better still as we neared the great rivers the Missouri and the Mississippi. After a stay of a few days at Chicago to see the wonders there, we went on to Sandusky, on the shores of Lake Erie, as we had heard of large vineyards and champagne-making being carried on there. Sandusky is a very nice town, well laid out, and with many good public buildings, and has many wood and other factories, and does a great trade in ice, which is got from the lake and stored in ice-houses during the winter; but it is a quiet place compared to San Francisco and Chicago, and puts one in mind of Geelong, in Victoria. From here we visited Kelly's Island, about twelve miles out in the lake; it is about 2,400 acres in extent, and is nearly all of it is planted with vines. The island is flat, and is nothing but a limestone rock, in many places with very little soil, in others a good depth. Large quantities of the stone are quarried and sent away for building and for burning into lime;

the vines are all pretty closely planted, and are all trellised with posts and three or four wires, being the first we have seen trained this way in America. None are grown here but the American grapes, the Catawba being the principal grape grown. Some grow the Concord for quantity and for sale as a table grape, and the Delaware to make sweet wine from. Of course we had no chance of seeing the fruit, as it is yet early in the season (July 9), and the vines only just off the blossom. They are very carefully pruned and tied to the wires and the ground kept well worked, which is easily done, the soil being of a sandy nature. Some of the vines are pretty old—up to twenty-five years—and do not make the rampant growth seen in California.

The largest wine concern on the island is the Kelly Island Wine Company, managed by Mr. Kelly. We called on his brother, who is president of the company, and he very kindly drove us in his carriage to the cellars, which are on the highest ground on the island, and well built from the stone taken out of the cellars. They do not grow grapes, but purchase all they can at prices ranging from \$20 to nearly \$100 per ton, the best prices being for Delaware and Catawba. They have a capacity for making 200,000 gallons a year if the grapes come in, but there are several other buyers and the competition pretty keen. Some of the Cincinnati winemakers buy here and make the wine, and then have it sent there to be finished into champagne. A new feature to us in wine-making presents itself here—that is, wine made from the skins of grapes, glucose, and corn spirit. The grape-skins, after being pressed, are put into casks tightly rammed and headed up until wanted, and they are busy here now making up this fabricated wine. Mr. Kelly defends the practice by saying that the acids in the wine, and especially in the skins, are in excess, and by this means they can make a wine which pleases the people better than the genuine article. The fermenting cellar is heated by steam-pipes running round and in front of the vats and near the floor, and many vats were fermenting and pressing was going on. The smell of the fermenting cellar and press-room was enough to condemn the whole thing to us, for it smelt more like a vinegar factory than anything else. In the cellars below ground, and which are very damp and unwholesome-looking, is made the far-famed Catawba champagne. The skins and juice of the grape, which is a coloured one, is fermented for from sixteen to twenty-four hours to get a little of the colour, and then drawn off and fermented in large vats. The wine is bottled at six months old, and is worked much in the same way as described in the account of Harazthy's cellars in a former letter. The presses used are powerful single-screw ones, worked by steam-power. The grapes are crushed in a wooden-fluted roller-mill, driven by steam in a detached building from the main

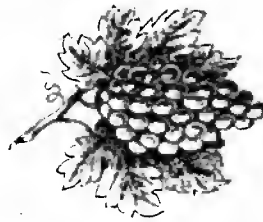
cellar, and the juice pumped by steam pumps into the fermenting cellars. We tasted some of the wines made here; a dry claret, a better Burgundy, and the new dry Catawba of the last vintage. It is generally sold under a year old, as it does not improve with age. Also tasted the champagne, which is very fair, but leaving a very peculiar flavour behind, as also does the dry Catawba. None of these wines were so good as those we got at the hotel. We stopped at the Sloane House, in Sandusky; we got there a very nice dry Catawba at 75 cents the bottle, clean and soft, and in splendid condition.

These cellars were burned down a few years ago, and have not been reinstated in their original plan, and are not nearly so well arranged as they might be for getting through the work of the vintage. The strength of the Catawba is said to be 11° of alcohol or 19·5° of proof spirit, but it hardly seemed so strong as that to us. On board the steamer we went to the island in, were some thirty or forty barrels of spirit, going out to strengthen the galled wines. This spirit costs, I was told, from \$1·20 to \$1·40 per gallon proof, and of that 90 cents is paid as duty. The phylloxera is said to be all over the island, but Mr. Kelly tried to find it to show me, but failed to do so. They do not fear anything from it, as the vines seem to resist it, and generally look healthy enough. There are several other islands in the lake where grapes are largely grown, but we had not time to visit them. On the shores of the lake for a mile or two back they are able to grow grapes, but farther away the frosts are too severe. No doubt the water tempers the climate to a great extent. Next day we visited the cellars of Mills & Co., on the mainland near the town. Mr. Mills kindly took us through. There is a vineyard here of fifty acres, mostly Catawba, but the growth is very feeble compared to some we have seen. They were being carefully trained to the wires by women, who get 70c. per day. They have no Chinese here working in the vineyards as in California. The underground cellars here are well drained, and kept cool when necessary by hosing with feed water. Ice can be got delivered here for 15 cents per 100 lb. Very little wine except champagne is made here, and the quality stands as high as any in the market. We sampled some, and found it very good, and with a decided Catawba after-taste, which, I have no doubt, would be liked after a person got used to it. The wine is worked in the usual way. Saw the disgorging and corking done. Very good corks are used, as much as \$6 per gross being paid for them. The wine sells wholesale from \$10 to \$12 per two-dozen case, and is very well got up, labelled, capped, and packed to resemble the French article as near as possible.

There is a fearful lot of sham and humbug in this country. We were very curious to know why at every little town we passed

of only a few houses the largest and most prominent store was always lettered up "Drug Store." We thought that the people must be very much in need of pills and plasters, but we have been enlightened since. One of the largest wine merchants dealing in American wines assured us that fully 75 per cent. of the wine sold by him and others and a large quantity of the spirits are sold in these drug stores, and that the people take it "medicinally" and require it very often.

We visited a few of the dealers in Californian wines in New York, but saw very little in them worth noting. It appears to us that a very large proportion of the wine is sold as imported, and the brandy worked off with corn spirit and sold as pure cognac. We tried brandy once on the way through New Mexico, but did not venture on it again.



PART 2.

NOTES ON VINEYARDS IN EUROPE.



LETTER I.

VOYAGE TO LISBON.—STREET TREES.—CINTIA.—COLLARES,
WINES OF.

MY former letters, describing what I saw in the wine cellars and vineyards in America, having been so well received, especially by the class to whom I have the honour to belong, and by the public generally, who always take a lively interest in the natural productions of a country, I am encouraged thereby to give the results of my extended trip through Portugal, Spain, France, and Germany during the vintage of 1883.

After spending about five weeks among our friends in England my son Robert and myself went on board the s.s. *Tagus*, one of the South American traders bound for Lisbon, on September 10, 1883. We have plenty of introductions from our friends Messrs. Hopkins, Forrester, P. B. Burgoyne, and others in the wine trade in London, and as we have left Mrs. Hardy in England we expect to get over the ground rapidly and follow up the vintage into France, and be back to England in a month or five weeks.

We got stuck on a mudbank in the Southampton Docks and did not get away until the next tide, early on the 11th; and after a very fine passage across the Bay of Biscay got to Lisbon at 10 a.m. on the 14th, and had to wait at the Custom-house until 2 p.m. to get our luggage examined. The Portuguese officials cannot be hurried. Lisbon is beautifully situated on the

broad Tagus. The buildings rising above one another and looking white and clean give the city a very pretty appearance from the river. Many of the streets are wide and straight, and there are many squares, very prettily paved with black and white stones, and planted with trees, but they are generally small and rather scant of foliage. The acacia, like we have in the Botanic Gardens in Adelaide, is the best shade tree. We had a walk through the principal streets in the evening. The shops are all small, but well stocked, especially the jewellers and the ivory and fancy-goods shops. Got up early and saw from our window crowds of people, mostly women and children, going off in steamers and boats to bathe down the river. At 6 a.m. we started by coach for Cintra, seventeen miles from Lisbon; fare, 3s. Saw many well-kept gardens outside the town and many trees planted, mostly the elm, acacia, and the Tasmanian bluegum, also a good many pepper trees and the alanthus. Saw many harbours overlooking the road, covered with vines, but the foliage rather scanty. The common bamboo, or Spanish reed, is largely grown, and is used for various purposes, among others for sticking peas and tomatoes, the latter looking very luxuriant. All the gardens are watered from wells or from reservoirs. The water-wheels, with earthenware pots and worked by a mule or donkey, are numerous, and there are a few Yankee wind-pumps. Saw many orange and lemon trees, but nearly all of them looking very poor and full of black blight and dead wood, the fruit very small and inferior, and the old trees covered to the tops with moss, none of them so healthy-looking as our own. Stopped twice on the road to rest the mules. As soon as we alighted, we were surrounded by beggars. On the coach we found two Englishmen who both spoke the language of the country, and we got on very well. At the first stopping-place we all went into a small wine-shop and got some of the red wine of the country, for which we only had to pay twenty reis, or one penny, for a small glass drawn from the cask; it was as light as a common Médoc, but not so rough. At the next place we stopped we tried a white wine called Bucellas, taken from bottles, and were charged twopenco per glass for it; it was very good and light and had a slight sherry flavour. Soon after leaving the suburbs we came in sight of the Penha, a fine palace built on the crest of a rocky mountain nearly as high as Mount Loftly.

We got to Cintra about 10, and had breakfast at Lawrence's Hotel, and then hired two donkeys and a driver, to take us to Collares, a village about five or six miles down the valley towards the sea. The driver, who did not know many words of English, was directed by Mrs. Lawrence to take us to some of the wine-cellars and vineyards. They were all small places. The first cellar we came to was a pretty lofty one, with wide doorways at

each end and all aboveground, with very thick walls, the roof of tiles laid on boards. There were no windows, and the only light was from the doorways. There were about twenty casks of about 300 gallons each, and all fitted with manholes and brass screws and caps in front. Two men were here getting ready for the vintage, and the only plant we saw was three or four tubs of 150 gallons each and one deep one of 250. One of the tubs was half-filled with black grapes just gathered. They were sweet, but with very thick skins and small stalks. There was no mill or press, and we understood that they trod the grapes in the tubs. The men were doing a little bottling and had a Gervais corking machine, which was the only machinery we saw. The wine they were bottling was of the previous vintage; it was very fair wine, of good colour, and in fine condition, and reminded us of our Tintara Mataro, only lighter in strength. Noticed here a handy funnel made of boards, about nine inches deep, and long enough to come quite to the front of a 300-gallon cask. The men seemed quite ready to show us everything and to give us wine to taste, and a present of a few reis to some small boys belonging to them; made all pass off pleasantly, and we then mounted our steeds again and proceeded further down the valley to the next cellars, situated in the village of Collares.

LETTER II.

VILLAGE OF COLLARES.—IRRIGATION OF FRUIT-TREES.—SANDY SOIL OF VINEYARD. — BREAKWINDS OF BAMBOO.—ANCIENT LOOKING VEHICLES.

THE village of Collares consists of a few houses scattered among the gardens on both sides of the creek running through the valley. It is here crossed by a bridge of many arches, built of stone, and about six feet high from the bed of the creek. Against the arches are placed moveable boards, which dam back the water of the creek, and nearly all of it is now diverted into channels on both sides to irrigate the gardens below. Near the bridge is a small square fenced in with stone posts, and shaded with plane trees, which grow very luxuriantly here. There are stone seats beneath the trees.

We went into another cellar here and tasted the wines. There were ten 300-gallon casks, but only one or two full. The wines

were nearly all red, and similar in character to those we had sampled before, and all of the last vintage. At the back of the cellar was a nice garden, full of fruit-trees, flowers, and vegetables, all irrigated.

We then crossed over the bridge and entered another cellar, which was merely a low lean-to shed, and very hot. A woman here gave us a glassful each of fair red wine drawn from a cask. We were rather surprised to find these thin wines stand so well on draught from the cask.

About a mile below the village we came upon the vineyards. They are on both sides of the creek, and extend nearly to the sea—perhaps three miles. The soil on which the vines are grown is as pure a sand as our sandhills on the seashore. In many places the sand has been removed to a depth of five feet, and thrown up on each side, leaving a trench wide enough to take three or four rows of vines at five feet apart. On the top of the bank is a breakwind made of bamboo set on end in two rows and filled in with brushwood and fastened together with longitudinal bundles of bamboo on both sides, and fastened with willow ties. These breaks are breast high, and from fifty to sixty feet apart, and at right angles with the run of the valley. Many of the bamboos take root, and form a living fence. The purpose for which they are erected is to prevent the vines from being buried with drifting sand. The hills beyond the vineyards are thinly covered with stone pines, and they furnish the only firewood we saw from the prunings and a few trees cut down. The banks are generally planted with pumpkins of the ironbark variety, and some very large ones are grown. Near the creek, and as far as the water can be led from it, the land is planted with fruit-trees, mostly apples, peaches, and pears. The margin of the creek is planted with the basket willow, and dammed at short intervals with earth dams, and trenches cut from them at distance of two or three chains. Into the gardens at the end of each trench is a waterhole, from which the water is raised with a whip and bucket to a stone-built channel, about six feet high, and so carried still farther into the garden, and then distributed to the trees in earth gutters. The trees are all small in size and very closely planted, and very little cultivated; but the fruit is very fine. We found a man and his son in one of these gardens gathering apples, and they very readily volunteered to show us round and explain to us the culture of the vines and trees. We noticed that the peach-trees are not pruned. We tried to find out from them how often they irrigate the trees, but did not succeed. The vines are very closely planted in the rows, and are pruned to leave one rod from two to four feet long. Sometimes two are left if the vine is very strong. These rods are laid about in all directions, and kept off the ground about a foot

with props of bamboo, and the growth covers nearly all the ground; the foliage is rather scanty and many of the bunches fully exposed, but we did not find any of them scorched with the sun, as we do in this country. The grape generally grown is a small round black grape, very similar to the Spanish grape we have under the name of *Ferastes Colora*. I think the long rod-pruning and taking the grapes early before they begin to shrivel is the reason for the light and sound character of the wine made here. The crop is very light—not more than 100 gallons to the acre, if so much as that. We met many of the labouring people; they all appeared well clad, and many of the children wore boots, and all looked happy. On our return we overtook our friends the man and boy taking in their loads of apples. They are put in deep baskets, holding about a hundred pounds, and two of them is a load for a donkey. We saw a few carts, drawn by pairs of bullocks, taking lemons and other fruits to Lisbon, the wheels solid and axles of wood, and turning with the wheels. The squeaking and creaking of them can be heard a mile away, and created a good deal of amusement for us, as did also the cries of the drivers to their cattle. Our donkeys took us well over the sandy country. They are small, but very strong, and are much used by tourists. We paid 1,800 reis—about 8s.—for the two and driver for the day, but suspect that we were made to pay far more than a native of the country would have to.

We missed the coach in the evening, and had to stop next day (Sunday). This enabled us to go to the Penha and enjoy the splendid view from the towers of the palace. We also visited the beautiful grounds of Viscount Cooke, a London merchant, and in the morning saw a small procession of priests and children with flowing robes and silvered helmets; but side spring boots rather spoiled the effect. It was headed by a band, and often stopped and let off rockets, a novelty to us in the daytime. We found Lawrence's Hotel very comfortable, and did not regret having been delayed here, except that it prevented us seeing a bull-fight at Lisbon in the afternoon.

LETTER III.

Oporto. — MESSRS. FORRESTER'S LODGES. — 1815 PORT. — AGED CELLAR-MAN.—MARKETS IN OPORTO.

STARTED at 8 a.m. for Oporto, distance 206 miles. Breakfast at Entrocamento, for which we were charged 500 reis, or 2s. 1d. Dinner at Aviero, 600 reis. At both places wine is put on the table free of extra charge, but it is generally very poor stuff, being so green and astringent. The second-class carriages are not equal to the third in England, and smoking is general in all. Women with bare feet come to the trains with water in earthenware jars, very clear and cool, and expect 10 reis (equal to a halfpenny) for a drink. Small clingstone peaches and a very nice small green fig are cheap enough.

18TH.—Called at Messrs. Forrester & Co.'s office, in the Rua Ingleses. The manager, Mr. Atkinson, being away, Mr. F. Standrin took us across the Douro to their "lodges" or wine-cellar. They have them in three places, but near each other. The largest consists of three adjoining cellars, each about 400 x 50 feet and from 20 to 25 feet high, and all above ground. The roofs are boarded over the rafters, and red tiles laid on the boards. They are lighted from the roof and at both ends, and are kept moderately light. The wine is all in pipes of 114 gallons, and set in four tiers in each cellar, with ample roadways between. Each tier is three pipes in height, the bottom one very close to the floor. The two top rows are set leaning a little forward for convenience of drawing off. The racking is all done with the tap and bucket, and no pumps are used. There are three vats for blending wines, all fitted with stirrers, worked by hand, the largest holding 80 pipes. They are said to be only used for blending inferior wines. Here are the offices and sampling-rooms, and a sample of every shipment is kept and numbered, and all particulars of the blend entered in a book. The samples are kept for three years, and from them they can blend a wine to follow up any particular shipment that may have been sent out. We tasted some ports of the last vintage and older, and at prices from £26 to £52 per pipe. The wine of a good year is kept by itself and sold as a vintage wine; the

inferior vintages go into blending and come out as one, two, or three diamond ports. We tasted a very fine wine of '81 vintage, which they said would be kept as a vintage wine, being very full, and of a deep rich colour and fine flavour. We also sampled several white ports, very sweet and strong; it is nearly all sent to Russia; also a very fine Muscat wine, very sweet, but clean and of fine flavour. The cap piece of all was a port of 1815, called the Waterloo port. We had tasted it before in Messrs. Forrester's office in London. It is the colour of brown sherry, of exquisite flavour and bouquet, and is kept as a curiosity. It has been kept filled up from time to time with newer wines, to "refresh" it as they say, so that how much of the 1815 wine there is in it would be difficult to find out. At this cellar is the principal cooperage, where a dozen or more men are employed making hogsheds and quarter-casks (pipes are bought ready made.) The only noticeable thing among the coopers' tools is the horse, in which the cask is laid to be grooved for the head. The staves are boiled for two hours, and afterwards soaked in a tank of cold water to extract some of the tannin from the wood. The casks are all said to be all seasoned with new wine before being used for shipment. Previous to use they are all measured by filling them with water from a tank with a glass gauge at the side, and, if over or under measure, are returned to the cooper and made to the proper size. We saw very few people at work in the cellars, and no racking going on. The utensils used are wooden buckets, holding about six gallons, and tub-shaped funnels of large size. Rotary pumps are used, but only for the new wines. The head cellar-man is 77 years old, and a fine, hale, hearty old man. He pointed to his teeth, which are still good; and when Robert said that port had been very slow poison for him he said he knew another cellar-man ten years older than himself, and still able to work. He has been nearly all his lifetime in the cellars of the company.

The cellar contains about 250,000 gallons, the next one below and nearer the river 200,000, and the lower one, where the new and inferior wines are kept, 150,000; and, with the exception of a few tonnels, the wine is all in pipes. The casks after racking are not filled up again for nine or twelve months, and the ullage caused by evaporation is not considered at all objectionable. Cork bungs are used. Both red and white wines are considered to be benefited by a certain amount of light. There is no particular arrangement for ventilation, and the walls are all black and the floors mouldy. In one of the cellars a man was employed cutting hoop iron into lengths, and punching these with two holes in each end; he did it by the eye, and so true that the rivets dropped into their places quite easily. We saw men carrying empty wine pipes on their heads, and all seem to prefer that way

of carrying burdens. Women do most of the carrying. We met a man, looking like a working blacksmith, in the street, and a woman trudging alongside of him with a hundred-weight bundle of rod iron on her head, which we supposed he had purchased and employed her to carry for him.

In the early morning during our stay in Oporto we visited the various markets, and saw in them many novel and interesting sights. The busiest time is from 6 to 7, and then one may see the middle-class women doing their marketing. Some ladies have a servant with them to carry their purchases; others hire carrier women, who stand in the market ready to be hired. All cover their heads with gaily-coloured shawls or kerchiefs, and we only saw one in the market with a French hat on. The carrier women wear no shoes or stockings, and wear a band or roll of stuff around them below the waist. The largest market was near our hotel, and was open every morning (Sundays included), and nearly everything is sold in it—heaps of sweet and water melons, some very large. The stone fruit is generally very inferior, and the grapes mostly are the common wine grapes of the country. We saw a few fine white grapes, which we found to be the *Belas Branco*, also a red grape like the *Malaga Muscat*. Apples very small; pears good, but not so fine as ours; peaches large, but nearly all clingstones; tomatoes and capscums very fine. There are no good fruit-shops in the city; people all seem to go to the market for their supplies. Maize bread is brought in from the country in large loaves, and is cut up in pieces and sold by weight; meat of all kinds; sausages of queer appearance; olives, both green and black; earthenware, baskets, and mats of all kinds, wooden spoons, and many articles of wearing apparel, boots and shoes, &c. We noticed that housewives purchased a very small quantity of meat to a large basket of vegetables and fruit.

We arranged to start early next morning to visit the port wine vineyards on the Douro, Mr. Standrin having kindly offered to accompany us.

LETTER IV.

THE UPPER DOURO, THE PORT WINE COUNTRY.—LOVELY SCENERY.
—BOA VISTA.—PHYLLOXERA, RAVAGES OF.—TREADING THE GRAPES.—FORTIFYING PORT WINE.

SEPTEMBER 19.

MR. STANDRIN met us at the station, and 7.30 a.m. we started for the Upper Douro, the port-wine country; at 10.30 we struck the Douro, and from this point we followed the river to Pinhao. The scenery as we wound round

the banks of the river was exceedingly beautiful. Many of the stations are so situated that glorious views both up and down the river is obtained from them. The hills on both sides are close to the river. The port wine vineyards begin about Regoa, which is a pretty large but scattered town. No one can imagine without seeing how pretty the terraced hills look, covered with vines to the very tops, and dotted here and there with the white houses of the peasants, and near the river, the fine houses and wine lodges of the wealthy proprietors. A few miles above Regoa we reached the country devastated with the phylloxera, and it is a sad sight to see nearly all these vineyards abandoned. The hills are all terraced with walls of dry stone from three to five feet high, which keep up the soil. This is composed of the decomposed rock with a very little earth. The terraces are generally ten feet in width, and two rows of vines are planted on each. A few olive-trees are scattered here and there, and near the river bamboo, and orange and lemon trees near the lodges. We reached Pinhao at 1.30, when it began to rain heavily, and we had to wait an hour at the station before we could start to go down the river, which we did in one of the boats, which had a high peak and stern, and was steered with an oar twenty feet long, and worked by three men. The only passengers were ourselves and the bailiff of the Boa Vista Vineyard, who met us at the station. The distance we had to go was about three miles, and we enjoyed the trip very much. We had to shoot three or four of the rapids, with which the river abounds. On going over the first we thought the boat was grinding on the rocky bottom, but it was only the bottom striking on the water. The boatmen shout to one another, and seem all excitement at the rapids. Boa Vista, which is well named, is situated on a projecting hill, and from the house a splendid view is obtained both up and down the river, the hills on both sides terraced to the tops. This place was bought by the Forresters in 1866, and kept as a country seat. Before it was devastated by the phylloxera it produced about forty pipes of wine. The extent of it is only about fifty acres. Nearly all the old vines have been dug up and the ground treated with sulphide of carbon and replanted with the old kinds again. Both here and in Oporto they have beds of American vine rootings, which they intend to plant here. The Mustang, or native vine of Arizona, has made most growth. After dinner, served by the old bailiff and his wife, we went over the vineyard and cellars. The vineyard is terraced in the usual way, and after the heavy rain very little earth is seen among the stones. The kind of grape mostly grown is called the *Touriga*, a black grape, very like the *Malbec*, but without the red-leafed stalk of that vine. The young vines two and three years planted look weak and sickly; a few American vines planted look healthy,

but have not made much growth. Many of the strongest of the old vines are left, and I should say have kept the phylloxera alive. On each side of the hill are gullies with small patches of rich soil, and in one is a small garden with orange and lemon trees, watered from a small spring, and the water stored in rock-built cisterns; in the other gully is a fine bit of soil watered from a small spring; here are beds of cuttings rooting. Among them we saw the Shiraz and Carbinet, obtained from Australia, and several of the American vines. Here also is a large space covered with old vines on a rough trellis; they are of fine table varieties, and one, called the Formosa, was a splendid large white grape. Beneath this trellis are grown pumpkins, cucumbers, and other vegetables. Several large clumps of bamboo are grown here, and this is the only support used for the vines about here. Near this gully are a good many of the old vines, which appear to have escaped the phylloxera and are bearing pretty well. There is a great length of wood on them, but they are carefully pruned with the shears and afterwards trimmed with the knife. In planting a new vineyard with cuttings they are used about three feet long, buried in a trench about a foot in depth, and the top brought up just above the surface; and very few fail to grow. Layering is frequently done, but grafting is not practised. The old bailiff believes that the failure of the vines is sent as a punishment for sins committed by the people, and hopes he is not one of them; and that when God has chastised them enough the vines will grow again. He does not believe that the small insect on the roots has anything to do with the death of the vines. The lagar or presshouse is a low building, and contains three large tanks or lagars, and one smaller one; the larger ones are about 14 feet square, and 2 feet 6 inches in depth, and all built of cut granite; the sides 6 inches thick, and well clamped together with iron; in the centre of each is a socket, firmly fixed, to receive the screw. These tanks or lagars are raised about 4 feet from the roadway in front, and a granite cistern, holding about a pipe, in front and partly under each lagar, receives the must when it is run off, and from these cisterns it is conveyed in granite gutters through a wall to the cellars lower down the hill. The grapes are gathered and brought in in baskets and emptied into the lagar until it is full enough. Sometimes two days' gathering is done before treading commences. About a dozen men then set in with bare feet and short trousers, and the grapes, stalks and all, are trod for thirty-six hours with scarcely any interval, and if that is not found enough for three or four hours more; the juice is not drawn off until the treading is completed. It is then run off into the cisterns below, and from them into the tunnels or large casks in the cellar. For every pipe of wine they reckon to get from the lagar, fifteen gallons of spirit are first put into the vats,

and when drawn off in the spring to send down to Oporto two and a half gallons more are added, and a further quantity before it is shipped to England—in fact, the wine is fortified up to 38° proof. Each lagar is said to contain grapes enough for sixteen pipes of wine. After the juice is drawn off the skins are heaped around the screw and pressed, but the pressed juice is kept separate, and only mixed as appears to be required afterwards. In the cellars are six tunnels of 2,400 gallons each, all cask-shaped with manholes in front; there are also a few smaller casks, all now empty. The tunnels when emptied are washed out with cold water and bunged up, and sulphur is very rarely used; we saw none about the cellars. We were very careful to ask about this, wines it is not required. We were very careful to ask about this, as so much depends upon the management of casks, when empty, in a cellar. The house is beautifully situated high up above the river and railway. It consists of one large room and several small bedrooms, with spacious balcony in front, and is just suited for the purpose it is used for. Everything about it is very clean and neat. Several Australian blackwood trees are growing about the house, but some have died from the long drought of three months which they have had. The road leading from the river up to the cellars is almost at an angle of 45°; but a pair of bullocks will take down a pipe of wine in the ancient looking carts used. The wine is all shipped on board the boats from bills of sandy beach, and sometimes from the rocks, by laying down a staging of planks. The boats have to be towed up the rapids with bullocks, and often the tow-rope has to be several hundred feet long to reach the places where the cattle can get footing. We were right royally entertained here, and the old bailiff thought we did not eat enough. The dishes we liked best were curried fowl and rice and delicious pork sausages; for dessert the small green fig and magnificent grapes; and for drink a good dry red wine, but no port; indeed, we never saw port drunk anywhere, except by English visitors, in this country. We went into the kitchen, which is detached from the house, to see the cooking arrangements. A fire on the floor in an immense chimney was surrounded by a dozen or more pots of brass and earthenware, and of various sizes. After breakfast next morning we returned to Oporto. After leaving the Douro we saw a great many vines grown over oak trees, which are planted round the small fields—and sometimes the vine entirely covers the tree. From these high vines the thin red wines used by the peasants is made. We saw some maize, olives, very little wheat or barley, no fences of any kind, and very few cattle grazing.

LETTER V.

LODGES OF MARTINEZ GAZIOT AND CO.—WINE-MAKING ON THE DOURO.—AUSTRALIAN TREES IN OPORTO.—WINES DRANK BY THE LOWER ORDERS.

VISITED the cellars, or "lodges," as they are called, of Martinez Gaziot & Co., at Villa Nova de Gaia, across the Douro from Oporto, where all the principal ones are situated. The main entrance is through a lofty doorway into a large courtyard with high walls against the street. The words "Ingleso Proprietario" may be seen over the entrance to this and many other lodges, which are wholly or partly owned by English firms, and is intended to protect them in troublesome times. The courtyard is nicely planted with shrubs and flowers, and vines are trained to shade a portion of it. Noticed that the odium was very bad on them. Here are the offices of the firm, in what was once evidently a private residence, and in them samples of all wines sent out for the last three years are kept neatly stowed away in cupboards. Mr. Ramsay, the general manager of the firm, being away, Mr. A. G. Nugent, the lodge manager showed us over the cellars, and gave us all the information we asked for. The cellars are exceedingly well kept, and the largest is about 150 feet long, and contains 1,900 pipes of wine in six rows, with plenty of room in the alleys. On each side are two narrow cellars, separated only from the main one by lofty arches, and from these others branch off toward the river. They are all roofed with tiles laid on boards. The principals of the older lodges are of chestnut wood, and very massive; but that wood is now scarce, and in the newer places deal and iron is used. They have also the cellars of an old convent, the walls of which are fully 30 feet high. They are all lighted either from the roof or high up the walls. In the principal lodges is an office for the manager, raised ten or twelve feet from the floor, to enable him to see all that is going on in the lodge. We were surprised to see so few men at work in these cellars. Racking is all done with the bucket, and two men generally work together, and when finishing a cask one man raises it steadily whilst the other checks it up. All the coopering is done on the place, and the men feed and sleep about the cooperage during the week, and go their

homes on Saturday and return on Sunday. They were scattered about having their midday meal, which appeared to consist of soup with cabbage in it, and eaten with wooden spoons out of coarse earthenware bowls; that and maize bread and onions is all we saw them having. They get only 1s. 6d. for making pipes, and twelve per week is considered good work for a man. Riga oak is used, and the staves are first boiled and then soaked in cold water. The new casks are always sent up the country for the new wine to season them. Casks that have to remain empty some time are sulphured, and all new casks are here measured, by placing them on a raised stage and filling them with water. They are then turned over on to an open vat with a glass tube and gauge at the side of it. Mr. Nugent has been with the firm many years, and has often had to go up the Douro during the vintage to superintend the wine-making. The firm purchase fifteen or sixteen "quintas" or vineyards yearly, and send up their own spirit, and have the wine made under their own supervision. The wine is generally delivered by May, and paid for at three payments at four months apart, and the quantity of spirit used deducted off the account. We saw a large quantity of spirit going up in boats and at the railway stations. Many of the wealthy proprietors hold their vines and mature them. Mr. Nugent gave us rather a different account of the treading of the grapes. He says that as soon as the lagar is full of grapes as many men are put in as can stand in it almost, three men for every pipe is considered the right thing, and they commence at 6 in the evening and continue till 12, and then let it rest till 6 the next morning, then a smaller number of men tread it all day until 6 in the evening, and again the next morning as long as may be required, and here comes in the greatest art in the making—to know the exact time to draw off; and can only be attained by long experience. The men are helped on with their monotonous work by a fiddle or guitar, and have short rests at intervals. The lager houses are all shut up at night while the treading is going on, and in a low building like that at Boa Vista they must get pretty warm with such a number of men in them. This prolonged treading of the grapes is the only way found to answer, and no doubt they get a more perfect fermentation and more colour than could be got by any other method. The pay of the men is only 1s. 3d. per day, and women 6d., and they have to find their own bread, but soup and other food is given to them, and a drink made by putting water on the grape skins after they leave the press is given *ad libitum*. We tasted some very fine wines at these cellars. We specially noted a port of 1858, almost the colour of brown sherry, but full of body and flavour; also white ports, and many other fine old wines, and left well pleased with all we saw, and with the attention paid to us by our kind friend.

Among the many noticeable things in Oporto is the immense width of the bullocks' horns. We were shown a pair measuring 7 ft. 1 in. from tip to tip. I measured the horns of one in the street, and found that they reached to the palms of my hands; the bullock boy looking on wondering at what I was doing, but was made quite happy with a present of 20 reis, or a penny. The bullocks are always worked in pairs, and led with a leather thong by a boy in front, and a man following behind. The yokes are a flat piece of board 10 inches wide, and quite elaborately carved and ornamented with tufts of hair, and are handed down as heirlooms in the family. On the Douro they are yoked just behind the horns with a large pad of leather in front, and hanging over the eyes. The carts have solid wheels of wood, and axles of the same, turning with the wheels, and are, no doubt, well suited to the steep roads they have to travel over. Many of the houses are faced on the weather side and front with glazed tiles of various patterns set in cement, and always look clean after rain. Water fountains abound. One just below our window is thronged with young and old of both sexes from daybreak till late at night. They carry away the water in earthenware jars on their heads, and men carry long kegs on their shoulders and supply the houses; and they give one a very small jug of it to wash with. We went into the fine old cathedral while mass was being performed. There was only one woman and three beggars inside besides ourselves, and lots of beggars on the steps outside. We got a splendid view of the town from the tower. 'Tramways go up very steep hills, generally drawn by six mules, and through streets not more than twelve feet wide between the kerbs. There are many fine squares, planted with plane tree, and we were pleased to find that the finest street tree was our Australian black-wood. It is kept pruned in the shape of an umbrella, and a good deal of wine business in the Rue Inglesse is done under their shade. The Rue Flores is full of jewellers' shops, and the beautiful fillagree work in gold and silver is largely made here. The carrier women wear large gold earrings often worth £10 the pair, and three or four inches long. The wine most used at the hotels is Collares, and charged 250 reis, or 1s., per bottle; a lighter and rougher wine called Palahete is also much used, and is charged about 9d. We never saw port at table, except in front of an Englishman or American; very little white wine is drunk. We called at many of the small wine shops in the city and tasted the wines used by the people; they are all dry, thin wines, and many of them so green as to be hardly drinkable. They are all, or nearly all, drawn from the cask. Food is generally supplied at these wine shops, and a strong smell of garlic is generally found in them.

LETTER VI.

WINE SPIRIT.—BATHING AT THE MOUTH OF THE DOURO.—OLIVE-TREES.—SEVILLE, INTERESTING SIGHTS THERE.—HOUSES BUILT TO SUIT THE CLIMATE.

SEPTEMBER 22.

CALLED on Mr. G. W. Tait, in the Rue Inglesse, or English-street. He is a great enthusiast about Australian trees, and has a large plantation of them on the Tagus. He took us to his brother, Mr. A. W. Tait, a wine and spirit broker. We were shown by him a wine spirit six months old 30° over proof. He said it was preferred at that strength to that run off stronger, as it gave more of the wine flavour in fortifying port wines, and also that it is much superior to corn or potato spirit for the purpose. This spirit was distilled at Leiria, and the grapes are grown there on the flats of the Tagus; and the kind grown is the Cariscambo—a white grape with a thin skin, and a heavy bearer. Spirit is always tasted with two thirds water, in dock glasses with a mouth not more than an inch across.

SUNDAY, 23RD.—Went before breakfast to the Foz, three miles from the city, by steam tram, to see the people bathe at the mouth of the Douro. Hundreds of people, both old and young, were bathing among the rocks. They are usually carried in by two women, with the bather's back towards the water, and dipped head first, and then let go, unless they are timid. At the mouth of the river lay a fine steamer, which was wrecked a few days before. We were recommended by an old traveller to furnish ourselves with some provisions for our long journey to Xeres to obviate the danger of being left behind at the stations where the trains stopped, so we purchased a pigskin holding three or four litres, and had it filled with a light red wine at 6d. per litre, some quince marmalade in solid blocks, and very nice, also some fairly good cheese and bread, very light but sour, as the bread is always here. The hotel charges here are very moderate, and at the Grand Hotel only a dollar a day; but the wines were always charged for. We started after a late breakfast at 2.30 for Xeres in Spain, and passed over a great many miles of poor sandy country, mostly planted with pine forests. The irrigated flats are a great contrast to these, and are luxuriant with the green maize. Both men and women were carrying away huge bundles of it to feed their cattle. Towards evening the train was

swarmed with agricultural labourers going harvestings, and apparently carrying a week's provisions with them. They invaded all the cars—first, second, and third class. We saw many of the houses of the peasants or small farmers, with the cattle housed below them. Travelled all night, and at daybreak were passing through miles upon miles of olive-trees, the country, barring them, just like Canowie. Many of the trees are growing out of beds of rock, and looked healthy; they appear to be of great age, and the top is very small compared to the bottom, and all are pruned to leave the middle open. In the rocky land they are not cultivated, but in better soil a crop of grain is taken from among the trees. We reached Badajoz at 8 a.m., but could not see the town; the country is open and destitute of timber. Near the town are a few vineyards in sandy land, the vines very small and grown without any support. A few fig-trees are scattered among the vines. Here are seen the ruins of a fine old Roman aqueduct of great height. From here to Cordova we continue to pass through miles of olive-trees, with not a fence to be seen of any kind, and very few cattle or sheep; now and then a flock of goats with a boy or girl tending them. Reached Cordova at 10 p.m. tired and sleepy, and had to wait there until 4 a.m., and no place to lie down except the floor. We were glad to get into a first-class car without any occupants but ourselves, and slept all the way to Seville, which we reached early in the morning. After a good wash at the Hotel Londres, which we needed, we got breakfast. We longed for raw tomatoes, and a vegetable and fruit merchant with his donkey happening to pass the door our wants were promptly supplied. The poor little animal was so loaded that only his nose and tail and a bit of his legs were visible. After enjoying our breakfast sallied out and got shaved by a barber of Seville, and then to the celebrated Cathedral, which the Spaniards consider the eighth wonder of the world; the interior is magnificent in its proportions and height. We here picked up a guide who agreed for half a dollar to show us round the sights during the three or four hours we had to spare, and he did his level best to trot us round sharp. We first ascended the old Moorish tower of the Cathedral. It is square, and ten paces inside measure each way, and has an incline all the way up instead of steps; it is very high, and from the top a splendid view of the city is got, also the orange-trees on the banks of the Guadalquivir and the distant hills covered with rows of olives, the ancient potteries, and the old Roman aqueduct, which still supplies the town with water. We were afterwards taken through streets so narrow that we had to step into a doorway to let a loaded donkey pass, to the old Alcazar or Moorish Palace, and through the beautiful gardens and the swimming baths, beneath the Palace, then to the Museum and Picture Gallery;

where Murillo's masterpieces are, and to Pontius Pilate's house, and back through the market to our hotel. The day was as hot as a January day in Adelaide, and we fully appreciated the shade of the narrow streets, and halted many times to admire the inner courts of the good houses. One can get a glimpse of them through the barred gates. They are cool and shady, with shrubs and flowers and fountains in them. If of any size they draw a light canvas blind across high up, as also they do in some of the streets. The iron gates can only be opened from the inside. The lower windows against the street are strongly barred, and every man's house is literally his castle.

The people sit and lounge about in these courts during the day, and are up early and late to their work. Tasted wine at several wineshops. The red wine is generally the Val de Penas, grown near Madrid; it is strong and flat, and does not mix with water like the Collares of Portugal. We got a very nice light wine made in the neighbourhood, with a slight sherry flavour; we always put down a penny, and are never asked for more for a glass. They do not seem to use any ice here, but keep all drinks cool without it in earthen jars and bottles and casks covered with damp cloths. We were only charged 9s. for breakfast and lunch, boots, and use of room. Our landlord is an Englishman, married to a Spanish lady. We are sorry our stay is so short in this interesting city, but we fear to lose the vintage and rush drying if we stay any longer here. We saw a drunken man here, the only one since we landed in this country. There is no doubt about the milk being genuine here, for they bring the cow with the calf muzzled to the customer's door, and milk her there and then, as we saw several times in our rounds.

LETTER VII.

XERES.—BODEGAS OF FORRESTER AND CO.—COOL ROOFS.—SHERRY, HOW KEPT.—MR. W. G. SUTER.—INTERESTING REMINISCENCES OF VINES SENT TO AUSTRALIA.—WALK AMONG THE VINEYARDS.—MACKENZIE AND CO.'S BODEGAS.—FINING THE WINES.

WE left Seville in the afternoon for Xeres. Much of the land we passed is a strong black clay, full of large cracks. The stubble left is very strong. In some parts we came on limestone country very similar to the hills about Nourlunga, and generally planted with olive-trees; the country very open

and no fences, and the people all living in villages, which are generally on the tops of hills. We arrived at Xeres at 7 p.m., and a porter at the station, who spoke a little French, seized our portmanteaus, and we had to follow him to the Xeres Hotel, which we found a good distance from the station. Our landlord spoke French, and some of the guests were English, and we met here Mr. Ferguson, manager for Mackenzie & Co., who invited us to their "bodega," as the wine-cellars are called here. The wine put on the table here is the Val de Penas, and is not charged for. We found the table well supplied, and the curried chicken and rice and the tortillas, or omelettes, good. A very large prawn is considered a delicacy, but we did not like them. We got very fine grapes and pears for dessert. In the evening we had a walk about the town. A large square in the centre of the town, with fountains and tall palms, was full of people, and the cafés round about were filled. Orange and lemon trees are planted in the streets as ornamental trees, but do not answer well for a street tree. On September 25, after breakfast, we went to the office of Forrester & Co., in the outskirts of the town. At 11 a.m. the manager (Senor Cayetano Castellon) came and received us very kindly, and showed us over the extensive bodega of the firm. It is a fine building, the roof supported by three rows of lofty arches. The walls are nearly thirty feet high, and both them and the arches are kept whitewashed, and the whole place looks clean and wholesome—very different to the old black walls of the wine lodges at Oporto. This bodega contains when full 1,800 butts of wine, each butt 108 gallons. The roof is of red tiles laid on latens. A flat tile with turned-up edges is laid first, then a half round tile covers the joint, and over that again a flat tile is laid in mortar, covering the half-round ones, and forming a complete double roof with good air space between, and must be a very cool roof. A broad cross alley leads to large doors, outside of which is the railway, which runs quite round the town, and accommodates nearly all the large bodegas. At the opposite end is the walled-in courtyard, entered from the street by massive doors, and planted with shade trees and shrubs; also vines trained over skeleton verandahs for shade. Here is an entrance-lodge and the offices of the bodega. The bodega is well ventilated and lighted from windows high up the walls. They are latticed on the outside and have a wooden shutter on the inside, which is closed when a hot wind blows from the east. The heat in the sun was 74° Fahrenheit, but the bodega was delightfully cool. The butts are generally three tiers in height, and all loosely bunged with cork bungs, and all on ullage one-ninth of the contents. The bung is merely laid on to keep out the dust, and not to exclude the air. The floor is of earth well trodden, and kept very clean. Many of the new wines are covered with a thick white scum, and this is

looked upon as a sure sign that the wine is improving. It has a very different appearance to the "flowers" on a wine which is turning sour. We tasted a good many wines which were given to us to show the different types of sherry. We were also shown many of the old solera wines, which are kept to flavour wines for sale or shipment; also a sherry said to be unfortified, but we found it very strong in alcohol; then Pedro Ximenes, made from partially dried grapes, very dark in colour, sweet and highly flavoured; also Muscat wine, made in the same way, very clean, and good of flavour.

The samples are all taken from the bung in a small silver cup, lashed to a whalebone handle about two feet long. The cellarman lets the wine fall into the glass from a considerable height without spilling a drop. Samples of every wine sent out are kept the same as at Oporto, and a complete record of the blends made for reference. Senor Castello then took us to the bodega of Mr. W. G. Suter, who is the British Consul here. He is a fine hale old man of 75 years. He was glad to see a vinegrower from Australia, and told us that he helped to pack and dispatch the vines that Busby collected fifty years ago, and was greatly pleased to hear from us of what great value they had been to Australia. His bodega is a fine building, in the same style as those already described. The floors are all paved with the ends of pipe staves. They are not troubled here with white ants, or they would not have lasted long. We drank a glass of fine old Amontillado with him, and he promised to send me a map of the sherry district made by him many years ago, and which promise he fulfilled the same day.

SEPTEMBER 26.—Got up early, and found several of the cafés already open. Got coffee and milk and sponge cakes. They always put a tumbler of cold water on the table with it. Then took a walk southwards out of the town, crossed several vegetable gardens with rich black soil, and watered with the waste water from the fountains in the town. The principal things now growing are a loose-growing cabbage, beets, capstems, and both yellow and red tomatoes. The capstems are very large and handsome. Then over a plain of light-coloured clayey soil, very full of large and deep cracks, to the nearest vineyard we could see. It was fenced with a tall hedge of the prickly pear, and we found a woman gathering the fruit for sale with a long bamboo split at the end. We got some from her, and found them very cool and juicy, and much larger than any we have in Australia. Whilst we were eating them a woman came out from the vineyard and invited us to enter, which we did, and went into the press-house. There were a few men about. They had just finished paring down the "cheese" and getting it under press again, and were about to have their breakfast. They offered us bread and

grapes; we took the grapes, but declined the bread. A very ugly old woman was cooking something in an earthenware pot over a few coals on the floor of the presshouse. A quantity of grapes were spread on mats in front, and some butts of juice just pressed off and not yet begun to ferment. There were only two lagars, or treading-boxes of wood, with wooden screws in the centre. The empty one was left dirty, and the whole place was dirty in the extreme. They gave us permission to go over the vineyard. It was on a hillside and closely planted, the soil a white clay and looking like old mortar, and where holes had been dug to layer vines we saw that the subsoil was nearly the same as the surface. We afterwards found that this was one of the second-class vineyards, and they are called "barros." Our walk back to the town was a hot and dusty one. The country looks as if there had been no rain for months, and the roads ankle-deep in dust. After breakfast visited the bodegas of Messrs. Mackenzie, near the railway station. Mr. Ferguson kindly showed us round, and gave us a great variety of wines to taste, among them Pedro Ximenes and Muscat wines, both very old and highly flavoured; Rota Tent, made from the Tinto grape, very luscious; also boiled must, used for blending; and all the different types of sherry. They ship some sherries as low as £16 a butt, and some firms do it as low as £12. The bodega is very clean and well kept, the roof lofty, and supported by brick arches, which cover over an acre of ground. A light is constantly kept burning in a dark lantern on a stand to examine the condition of the wines by. Tall, straight-sided glasses are used to compare wines for colour and condition. Gelatine is much used for fining, and is prepared for the wine merchants as they want it, and supplied to them ready for use in a semi-liquid state, and looks like starch. Clay and whites of eggs are also used for fining the wines.

LETTER VIII.

SHERRY VINEYARD.—KINDS OF GRAPES GROWN.—MODE OF PRUNING.—PRESSHOUSE.—OLD CHAPEL.—TREADING THE GRAPES.

PRUNCTUALLY at 1 p.m., as arranged, Señor Castillon called for us with a covered coach drawn by three mules. We were driven out of town past the beautiful garden, and bodegas of Gonzalez, Byass, & Co., and for some distance along the road we travelled over in the morning. We then turned off,

and at about two miles from the town came upon vineyards on both sides of the road; no trees except a few pines near the cellars. At four and a half miles we came to the La Contessa Vineyard, owned by Señor Don Antonio de Beerio, who is an old bachelor and a great friend of the Forresters. The vintage was in full swing here, and the place very well arranged and kept, and the proprietor very hearty and willing to answer the numerous questions we put to him. The vineyard is eighty acres, and is situated on a hill; the soil a calcareous loam, and has nearly the appearance of old mortar. It is one of the "alfura" or chalk vineyards, and of the first-class for fine sherries.

The vines are pretty regular and about five feet apart, and appear very old. Many of them are a mere shell, the stock being quite hollow, and yet they bear good wood and fine fruit. There is a tank in front of the cellars with the date 1726 on it, and the vineyard is said to be older than that, but all the vineyards are being constantly renewed by laying down old vines and making layers to fill up where vines have died out or become unproductive.

The kind grown are, first, the Palomino Blanco, which we have in Australia. It is the vine most like the Sweetwater of all the Spanish kinds, both in the wood and leaf. The next in importance is the Manu Castellano Blanco. It is very much like the Palomino. We also found the Doralilla under the name of the Montua de Pila, and we were also glad to find the grape grown so extensively about Angaston and called the sherry grape. It is the Albillo, and is considered to be one of the best of the sherry grapes, and is grown more or less in all the vineyards. We saw very few of the Pedro Ximenes in this vineyard.

All the kinds named are grown without any attempt to keep them separate, and the crop is gathered altogether.

The vines are all grown to a stem about fourteen or fifteen inches high, and carefully trained to one rod of from five to eight eyes, and this rod is often bent and twisted round and made to lie across the stump, and sometimes propped with a short piece of bamboo to keep them off the ground; another shoot is allowed to grow at full length without fruit to give the rod for next year; we sometimes saw a third branch, but not frequently. The crop is said to be good this year, and appeared to us like 200 gallons to the acre. We passed a piece of ground that was being trenched to about eighteen inches in depth. We saw that the subsoil was all chalk, easily broken up. We asked what they trenched for, and all the answer was to bury the seeds and weeds. The cultivation is all by hand labour, and is very thorough, and is said to cost £10 per acre. The tool used both here and in Portugal is a heavy hoe with a long blade, and set at a very small angle in the handle. The labourer has to stoop very low to use it, but

they will not use any other, and do all sorts of work with it.

The presshouse is a large building with a broad verandah in front, and situated on a hill, from whence a fine view of the country, which is nearly all in vineyards, is obtained. At one end of the verandah are the rooms used by the proprietor when here, and between them and the presshouse are the kitchen, office, and other rooms. There is also a small chapel, which the proprietor said was rarely used since the peasants had taken to read the cheap newspapers. In front of the presshouse is a yard of fully half an acre in extent, level and gravelled. Here the grapes are brought from the vineyard and laid out on round mats made of esparto grass to get the sun for at least twenty four hours. The men who were gathering were coming in in Indian file, with a square box, broad at the top, on the head of each. A boxful is spread on each mat, which is about thirty inches in diameter.

For Pedro Ximenes and other sweet wines the grapes are allowed to lie from eight to twenty days. They were also bringing in grapes from a distant part of the property with bullock-drays, in deep tubs holding about 100 lbs. each. They had been already laid out on mats near where they were grown.

They were from a vineyard of eighteen years old, and which is not considered to have arrived at its best yet. De Beerio said that the wine from a vineyard up to ten years old is only fit to distil, but I doubt if it is so used. These grapes were being mixed with those from the old vineyard in a proportion of one-third. The presshouse is very lofty and large, and contains twelve lagars or treading-boxes, nine on one side and three on the other. They are about eight feet square and eighteen inches deep, with sloping sides, and are made of $1\frac{1}{4}$ -inch pine well put together. In the centre of each is a wooden screw; the cap containing the nut is $3\frac{1}{2}$ feet long and tapered to a handle at each end. De Beerio kindly had a lagar of grapes brought in and tried to let us see the process. Each lagar is said to take grapes enough to give a butt of juice, and as they are emptied into the lagar from four to six pounds of powdered gypsum is strewed over them, and this practice is universal and has been done for ages. Three men then got into the lagar with short-legged duck trousers and heavy nailed shoes, and, after spreading grapes all over the spare space, commence treading, moving quickly in line backwards and forwards, and with a motion as regular as step dancing.

They are very active fellows, and perspire freely, but smoke their cigarettes nearly all the while. When tired enough they shovel them up into a corner and let the juice draw away, and then spread out more, and so on till all are done. They then spread the whole lot and tread them over again, the juice running off all the time through the spout, on which is hung a basket to

keep back the seeds and skins; after this final treading they are heaped up round the screw, and gradually brought up as the juice leaves them to four feet high and two and a half feet in diameter. Then a band of esparto grass three inches broad is cleverly wound round and round from the bottom upwards, and the pressure is then applied. The whole thing up to this took one and a half hours to do. It is usually done at night, and the pressmen get extra wages. After pressure they are put through a sieve on legs with one and a half inch mesh to separate the stalk. Water is then put on the skins, and they are pressed again to make an inferior wine; and finally they go into mats of esparto, and are pressed with a handy hydraulic press, and the juice used for distillation.

FERMENTATION OF SHERRY.—DENSITY OF THE MUST.—HOSPITALITY OF THE PROPRIETOR. DUFF, GORDON, AND CO.'S BODEGAS. FINE OLD WINES.

LETTER IX.

AS soon as possible after pressing the juice is sent to the proprietors' bodega in Xeres. We met many drayloads going in as we came out, generally three butts in each load, and drawn by scratch teams, sometimes a big horse in the shafts and a couple of mules leading, and sometimes a donkey or two between. A tube of bamboo or tin is fixed in the bung-hole to allow the gas to escape. The shaking up of the lees in the partly fermented juice is said to be beneficial. It is allowed to complete the fermentation in the bodega at Xeres; a vacancy of two arrobes is left in each butt (a butt contains thirty-six arrobes), and a large iron or earthenware funnel, holding two or three gallons, is fixed in the bung-hole and causes the yeast to return into the cask, as described by Busby in his notes published fifty years since. De Beerio says that no spirit is used until the fermentation is finished for sherry, but to make Pedro Ximenes three arrobes of spirit are used, and for very sweet wines six arrobes, and it is always put into the cask before the juice from the press. We were fortunate enough to see the density of the juice as it ran from the press. It stood at 12° by Baumé's saccharometer, equal to 34° by Brewer's or 1,090 sp. gr. De Beerio said the pressings would reach 13°. The grapes we saw

gathered were not at all shrivelled. We noticed that none of the lagars which had been used had been washed. The vintagers were all men, and paid about 2s. a day, which is a great advance on what used to be paid. After seeing the pressing we were invited to lunch, and were waited on by a very active brown-skinned black-eyed girl. Among other dishes was a splendid foreham of pork, said to be over two years cured. We got excellent bread here, better than any we have seen before, and good light red wine; the large Spanish olives and Bologna sausages, and very fine grapes and pears for dessert. The grapes were the Belas Blanco, here called the "Beva," also the delicious green fig and two kinds of fine old sherry. We preferred the lightest, and De Beerio drank the same, and said he was old enough to know what was good for him. He also kindly had a dish of "Gaspachio" made for us to taste. It is a cold soup, made of tomatoes, garlic chopped fine, oil, and vinegar. It is very nice and refreshing, and is used as a drink at all times of the day, especially in hot weather, and would be liked in Australia. After a few more glasses of the old Amontillado, not forgetting to drink the health of the Messrs. Forrester, we parted on the best of terms with our genial host, and returned to Xeres at dusk, well satisfied with our day's work.

SEPTEMBER 27.—Got up early and walked out of town, intending to see some of the "arenas," or sandy vineyards, but took the wrong direction and came upon more of the "barros," or clay vineyards. Went through several of them, and found the same admixture of grapes as before; in one of them the predominant grape was the same as is grown at Rosefield, near Adelaide, in the north-east corner of the vineyard there. In passing through a deep railway cutting, noticed that the sulsoil was full of small scallop and other shells.

After breakfast took rail to Port St. Mary's, which is reached in half an hour. Called first on Duff, Gordon, & Co., to whom we had an introduction from Mr. John Hopkins, of London. The manager not having arrived, we were shown over the splendid bodegas of the firm by one of the head clerks, a German gentleman, who very kindly gave us all the information we asked for. The bodegas are on three sides of a spacious courtyard, which, as usual, is entered through massive doors. The courtyard is planted with fine shade trees, and vines are trained overhead to give the shade so much needed in this warm climate. The shipping bodega is a splendid building of six bays, divided by lofty arches, and kept in first-class order, and as clean and bright as whitewash can make it. At the end at right angles is another nearly as large, in which are kept the choice light sherries; it is kept pretty dark with mat blinds over the windows. The windows were all open; they have lattice outside and wooden shutters

inside. They send out sherries up to £200 per butt, and some of the old "solera" wines are not to be bought at any price. When a portion of them is drawn off to make up a blend it is filled up again with the next best wine by putting a bent tin tube in the bung-hole, and which reaches to about half the depth of the cask, and the funnel fits into this tube, thus preventing the lees being disturbed. The funnel is made long and narrow, so as to pass in between the butts; the casks are all loosely bunged with cork hungs tied to the cask with a string. The ullage is the same as we found before, about one-ninth of the contents of each cask.

The evaporation is said to be not more than 2 per cent; we saw no pumps in use here, but were told that they use them in some of the bodegas.

We were shown the cooorage and place for steaming casks. The new casks are first filled with lime-water for some time, then emptied and steamed, and then unleaded and well scrubbed out, and if intended for *fine* wines are first used for new wines, but for ordinary sherries this is not done. We afterwards visited the bodegas of Sancho, Hermanos, & Co., but saw nothing special there, and returned to Xeres. There is a grand bullfight on at Seville to-day, and a very long train, nearly all third class passengers, left Xeres just before us in the morning. There is no regularity about the starting of trains, and the people wait very patiently, the busses always get to the station from twenty minutes to half an hour before the time for starting the trains; no one believes in being hurried in this country. I begin to think that we drive much too fast in Australia to live the years we ought to.

LETTER X.

IVISON'S "BODEGAS."—STRENGTH OF SHERRY.—DISTILLATION OF WINE.—FALLING OFF IN THE SHERRY TRADE.—INFLUENCE OF SOIL ON THE PRODUCE.

AFTER our return from Port St. Mary's we went to see the bodega and distillery of Mr. Ivison, in Xeres. He is an Englishman, and we were well received and shown over the establishment by him. He is a large buyer of grapes, both for wine and distillation; his bodega is large and well kept and very full of wines. He showed us a great many, both old and

new; one was a sherry eight years old, still far from bright and full of sound, and not at all nice to the taste; yet he considered it a promising wine. A wine of '81 vintage from one of the "arenas," or sandy vineyards, was quite bright, and fit for use, but had very little of the sherry flavour, and he said it would not improve.

We went into the cellar where the new wines were still fermenting, all in butts. Many of them had still the funnels before described in them. Some butts from a vineyard of his own and fourteen days pressed were still fermenting a little, and quite milky in appearance. He thought a good deal of this, and said it was about 25 degrees of strength, and that nearly all the good wines this year would reach that, but that they were fermenting too quickly for good wine. If 26° is the strength of the natural wines, when is the extra 10 or 12 per cent of spirit added? We cannot get at this; they all say it is added as the wine appears to want it. I think that must be pretty soon and often. In the yard was a large number of hogsheads and quarter-casks filled with water to season them. Some of them smelled very bad. He said that steaming casks was not so good for them as boiling water. He has a good way of filling casks from the steam-boilers with a bent copper nozzle made to drop into and fit any bung-hole. In the yard were several drayloads of grapes brought in loose, and were being filled into mat baskets and weighed, each mat holding about 100 lbs., and then carried to the lagars by two men. They were a mixed lot and some black ones among them; the price paid about £5 per ton; he said they were for distillation. There were several lagars round two sides of the yard under open sheds, and in some of them men were busy treading the grapes. The lagars here were all fitted with cast-iron screws, and there were two of the hydraulic presses at work to get all the juice possible from the skins after being pressed in the lagars. After the first pressing in the lagars the stalk is separated from the skins, and the latter are then put into round mats made of esparto grass and about three feet in diameter, and piled one over another in the press. These mats cost 1s. 2d. each, and stand any amount of pressure without bursting.

The butts are filled at the lagars and rolled into the fermenting cellar some distance away. None of the lagars had been washed after being used; it could not have been from a scarcity of water here, for there are large tanks full of it.

The distillery occupies the centre of the yard, and is fitted with two of Colley's patent stills. They are principally of wood, and the largest of them will turn out about 100 butts of strong spirit per day, and the condensing is nearly all done with the wine to be distilled. A rectifying still by the same maker is not much used, as it takes 140 butts of water to condense one of spirit.

He said that for fortifying new wines wine spirit was not required to be very pure and strong, but for old wines for shipment the purest and strongest article is always preferred. In the yard were two large square coppers, in which must was being boiled down. They are fitted with steam coil in the bottom of each. The must is boiled down to one-fifth, and then mixed with unboiled must in proportion of one to five, and then fermented, and is used for colouring brown sherries. Saw some of it before it was mixed; it was about the consistence of treacle, and not having at all a burnt flavour. He said it was dangerous stuff to use, and very apt to "turn up" wines and make them ferment again. We saw no other material about the place to distil from except wine.

M. Ivison and all the other wine people complain sadly of the trade in sherry falling off of late years, and certainly one sees no new vineyards being planted, and some old ones on the sandy lands going out of cultivation. We noticed that many of these sandy vineyards had a limestone subsoil, as seen in the ditches along the railway lines. Some of them were a red sandy loam, and when trenched turned up in large lumps. We are sorry not to have seen more of these, as they looked so much like some of our Maclaren Vale land. We would also have liked to have studied the wines from the different soils around Xeres more than we had opportunities of doing; but we saw enough to show us that it is the soil that makes the great difference in the value of these wines. I have taken samples of the soil and subsoil of these vineyards, and which I hope to take back with me. We saw a troop of Spanish soldiers at drill in the evening, and they did not impress us very favourably, for a more slovenly dirty lot of undersized men I never saw before as soldiers.

LETTER XI.

MALAGA. — SUNDAY TRAFFIC. — RAISIN-PACKING. — SCHULTZ.
HERMANOS, AND CO.'S CELLARS. — WINE FROM RAISINS.

SEPTEMBER 29.
CAME from Xeres via La Roda and Utrera to Malaga. The first part of the journey to La Roda was through grain growing country, where we saw steam threshing machines at work, and all the people in the train crowded to the windows to look at it. Much of the country passed, especially about

Aquadulce and Pedrera, is like the hills between Noarlunga and the sea, having the same red soil and hard limestone beneath, and generally planted with olives. The olives look healthy, but not quite so vigorous as those on the granite lands near Badajoz. We saw many new plantations and single trees to fill up vacancies, all planted as truncheons, standing five or six feet out of the ground, with a mound of earth neatly built up around each. This mound appears to be gradually taken away as the tree gets established. One old olive plantation had been cut down to the ground, and three or four new shoots allowed to grow from each stump. We saw men pruning and removing suckers from old trees; they are generally planted from thirty to forty feet apart, and in good land cultivated, and a crop of grain grows between. In rocky land the trees do not appear to be cultivated at all, but grazed with sheep and goats. We got to Malaga in the evening, and after dinner took a turn through the principal streets, which we easily found by following the people. The two principal retail streets are very narrow, with no vehicle traffic through them. Next day (Sunday) we got up early and strolled round the wharfs. Found all the shops open as usual, and trains of donkeys coming in from the country laden with raisins, grapes, and skins of wine. Each driver has generally seven donkeys; the one that takes the load has an enormous bell, and the driver rides on the rear animal, which is also made to carry a load besides the driver. We attended the English Church at the British Consulate; very few people were in attendance. In the evening saw a grand religious procession, nearly a mile in length. It was to have started at 6, but it was past 8 before it got off, and we lost our dinner by waiting for it. The cafés and many shops were open. At one of the cafés there were quite 200 people inside, and on the sidewalk outside, all seated at small tables, drinking, and smoking their cigarettes.

OCTOBER 1.—As we had no introductions to any one here, we called on the British Consul, who advised us to call on any of the large fruit merchants and make ourselves known. We first called on Messrs. Bovan & Co., large exporters of raisins. Mr. Bovan kindly sent a clerk who spoke English round the establishment with us, and would have gone himself but for an engagement. We were shown the whole process of repacking the raisins into clean paper, laying on the fancy papers on the top, nailing down, stencilling, &c. Most of the work is done by women, and they are very quick and clever at it. In a large room a number of women were preparing Jordan almond kernels for packing by filling up all cracks and flaws in the skins with a paste made of the dust from the almonds and slavs in the skins with a paste made of three grades; the lightest in colour are the best. The nut is a hardshell, and they are cracked by women with small hammers.

We also saw a quantity of very small and inferior figs in mats.

We next called on Campanzuno Brothers, another large concern. They were very busy packing, and had a great number of women employed. They showed us a sample box of all the different qualities of raisins, seven or eight in all. Quantities of raisins were coming in, all brought on the backs of donkeys. One of the partners kindly sent a clerk with his card to accompany us to the largest manufacturers of wine in Malaga, Messrs. Schultz, Hermanos, & Co. Here also we were very kindly treated, and shown over their fine cellars and allowed to taste all their different wines—red and white Malaga, Pedro Ximenes, Rota, Port, Sherry, Muscatel, and others—from one to 100 years old. The wines are all in butts, and are kept full and not on ullage as in Xeres, and bunged moderately tight with cork bungs. The cellars are of three stories and all above ground; the floors are very strong and supported by cast-iron pillars. Butts of wine are pulled up an incline on a truck to the top stories. Rotary pumps of Vienna make are used and copper syphons for drawing off the wines. The windows are all closed with wooden shutters, and a small door in them is opened as we go along to give sufficient light, and closed again afterwards; this is the first cellar we have seen kept very dark. Crossed a street and into a large paved yard; on one side was another large cellar of three stories, containing all new wines. Men were pumping wine across the street into the cellars we came from. Noticed that the hose was carefully covered with canvas. A small steam boiler is used for steaming kegs and casks; a deal of the Malaga wine is sent away in kegs holding an arroba, or three gallons. On the opposite side of the yard is the lagar or treading-floor, under an open shed. It is about 30 feet long by 20 wide, and floored with brick set in cement, and sloping to several outlets, where brick and cement tanks of about 200 gallons each receive the juice as it runs from the floor. A number of men were treading raisins to make sweet wine; they wear shoes made of esparto grass, and tread the raisins into a paste, using a little water as they go on. They are pressed with two powerful screw-presses similar to one in use at Auklana, and which are set up in the middle of the lagar. After pressing the skins and stalks are put into three large cemented tanks at one end of the lagar, and water put to them to make vinegar. At the other end of the lagar is the store for raisins, and here the baskets of raisins were being emptied from a raised bridge as they were brought in from the country. The grape was said to be the Pedro Ximenes, and they are dried sufficiently so as not to heat by lying in heaps. The price paid is equal to 4s. for 25 lbs., about double the price paid for the best undried grapes for wine-making. "Arrope," or boiled must, is made by boiling the unfermented juice in deep

iron coppers to one-third; the coppers are small at the bottom, and lined with coal or coke. One of the partners showed us round this part of the place, and seemed pleased to find us take so much interest in this part of the work. He showed us a sample of grape spirit, taken out of a butt with a silver instrument like a spoon with a hollow handle, and which answers as a dipper and glass both. This spirit was made by the firm at a distillery seventy miles from Malaga. It was very clean and of good flavour, and he said they consider it very much superior to grain or any other spirit for fortifying wines. He said it was 58° by Gay Lussac, and worth £26 per butt, while grain spirit could be had for £18 to £20. We were very much pleased with the attention shown us, and consider this one of the most complete and well arranged places we have yet seen.

LETTER XII.

RAISIN-MAKING AT MALAGA.—MUSCAT GORDO BLANCO THE GRAPE GROWN.—DRYING GROUNDS.—PACKING THE RAISINS IN LAYERS.—RATE OF WAGES.

OCTOBER 1.
WE were recommended by Mr. Bevan to visit the "Hacienda," or farms of Senor Orosco, who is the Mexican Consul in Malaga, as the best place to see the drying and packing of the celebrated Malaga bloom raisins, so we took a cab to San Rosalio, which is the name of the farm, or rather country house and grounds. It was only a mile or two out of the city, and we could easily have walked, but the cabmen and waiters represented that it was eight or nine miles, just to plunder us in the fare asked. The road is partially metalled with a very soft stone, and fearfully cut up, and several inches deep in dust. The trees and shrubs alongside the road are covered with white dust, as bad as ever we saw in Australia. Fortunately there was no wind, or we should have been pretty well smothered. The only bright things seen are the patches of sugarcane, which are irrigated and look beautifully green and luxuriant. We took an interpreter with us from the hotel. He was a Swiss, and professed to know all the European languages, but did not know any, and we could have done better without him, as he was constantly giving us his own opinions instead of putting the questions we wanted

answered. We found the work of sorting and packing the raisins going on here, and fifty or sixty men employed (no women or children). The grapes were all gathered by the 18th September, or thirteen days since, and are nearly all dried into raisins. The vineyard is of considerable extent, the land quite flat, and the soil apparently a dull reddish alluvial loam, with abundance of waterworn stones. We asked if it had been trenched, and were told that it had to the depth of the knees. We saw traces of a red marly clay here and there, as though it had been brought to the surface by trenching. The vines in the oldest part of the vineyard are planted six feet apart each way, and the new vineyard, which, however, is eighteen years old, is planted fifteen feet apart between the rows, and only three feet between each vine in the rows. The vines are grown very low, and the lower branches touch the ground; a hollow is scooped out round each vine for the bunches of grapes to hang in. They are pruned very close, only one or two buds on each shoot, and are not generally more than five or six shoots on a vine, and none are staked. We found a few grapes that had been missed in the gathering; they were not larger than we grow at Bankside, but more solid; they are all the Muscat Gordo Blanco, the same as we have, and no other grape is used for raisins as far as we could learn. In planting a vineyard cuttings from two or three feet long are used, and laid horizontally in a trench about nine inches deep, and the top brought up and a mound of earth drawn up around it to keep it upright instead of a stake, for two or three years, saw many layers made to fill up vacant spaces. We could not find that the vines are disbudded during the growing season, and they did not look as if it had been done to any extent. The vineyard is all worked by hand labour, and was very clean and free from weeds. The drying grounds are of two kinds. The first are built up with brick walls, and filled in with earth; they are generally from 20 to 25 feet long and 14 or 15 feet wide, and are divided into spaces 6 or 7 feet wide with bricks set on end and standing 4 inches above the floor; they slope from close to the ground at the bottom at an angle of nearly 45°, and face the south. The floor is covered with several inches of clean small gravel, on which the grapes are laid in small bunches, and very regular. We saw one which was covered with grapes on the 18th September; the grapes were nearly dried, and had not been turned, as we could perceive by the stalks of the bunches; they were nearly as dry on the under side as on the top from the heat of the gravel. When they are sufficiently dried, covers made of two 9 x 1 inch deal boards fastened together, and overlapping like weatherboards, are laid over them until they can be gathered up. These covers are put on at night, during the time of the drying. When they are gathered up the men kneel on these

boards, and, beginning at the bottom, sort them into three grades beside the loose berries, and lay them on boards three or four inches broad. They are then carried into the house (which was not occupied), and every room and the staircase, on and under the bedsteads, and every available place was full of these boards with raisins, piled one on the other. We were given to understand that they remained in this way a month before being packed, but as they were busy packing we think they only remain until they are ready to pack them. The other kind of drying-floor is flat, or only slightly raised in the centre. They are provided with a ridge-pole and cloths to cover them at night, or when required. We were told that the grapes do not dry so soon by eight days as on the sloping floors opposite the sun. Packing and sorting was going on under sheds of bamboo, and in a large room adjoining the house the men all sat at their work, and most of them were smoking their cigarettes. Each man has a small pair of scissors, with which he cuts out all defective berries, pieces of stalk, &c. Some pack the layers for the bottom, and others for the top of the boxes. Each layer is laid on paper spread on a box cover, and made to a certain weight. The men that prepare the top layer are very clever at it; they turn and twist the raisins, to make them come in rows, and fill up with single raisins pulled out to flatten and make them look large. After they are laid on the boxes they are set out on another in the same way as we do in packing grapes for export, and that is all the pressing they get so far as we could see. We did not see any kind of press about. The boxes are only lightly nailed, as they have all to be repacked in clean paper in Malaga before they are shipped. The men are paid at different rates, according to the work; the lowest at six reales, or 1s. 3d. per day, and the highest at nine reales and a dinner consisting of soup and brown bread. They are fearfully slow at their work, and it would not pay in Australia to go to the trouble they do in sorting and packing. We were glad to have so good an opportunity of seeing the whole process, and also that we got in time to see grapes still on the drying-floors. I have no doubt that the gravel floors are the best possible thing to have, as they retain the heat and allow a current of air to pass beneath the grapes. We shall have to find out the best localities for growing fine fleshy fruit, so as to produce large raisins, and also where they will ripen early, so as to get the full benefit of the sun in drying. On the wharfs we saw men and women under rough sheds of bamboo packing lemons for shipment. They are quite green when packed, and each lemon is wrapped in a piece of coloured paper. All sorts of cooking is to be seen going on in the streets, and swarms of beggars at every step—some of them loathsome looking from disease, loss of limbs, &c.

LETTER XIII.

VALLEY OF THE CAUDALJORCE.—POMEGRANATES.—ROMANTIC SCENERY.—ALCANZAR; WINE-MAKING THERE.—VINEYARDS NEAR THE TOWN.—KINDS OF GRAPES GROWN.

OCTOBER 2.

LEFT Malaga early and travelled up the Valley of the Caudaljorce. For nearly thirty miles the rail passes through a strip of country apparently from one to three miles in width, the whole of which is irrigated from the waters taken from the river and carried round at the foot of the barren-looking mountains on either side of the valley in channels, often substantially built of stone. This valley is a perfect marvel of fertility, orange and lemon-trees, datepalms, now fruiting, pomegranates, and other fruit-trees, with every foot of ground between them and close up to and even under the trees, planted with small crops, such as dwarf beans, tomatoes, capsicums, and various kinds of vegetables. The clean looking whitewashed houses of the cultivators peeping out among the lovely green foliage and the numerous population show an Australian the possibilities of irrigation on a large scale to sustain a dense population. On the lower slopes of the mountains many vineyards are seen, and several drying-grounds for raisins on the steep hillsides facing the south. We also saw a few almond groves on the hillsides, but looking very poor and stunted and scant of foliage. Near Malaga are many large patches of sugarcanes. The orange and lemon trees in several places had a deal of dead wood in them, and we were told it was caused by a drought last year when the river failed to supply the necessary water for irrigation, but they had since recovered and had made strong growth again. At the stations, which are very frequent, women brought to the train pomegranates which have cracked and are not fit to send to Malaga, but are deliciously cool and juicy, and sold at from two to three a penny, and were readily bought by the passengers. At the head of the valley the railway passes through a gorge in the mountains, and the momentary glimpses we get of the scenery as we emerge from the numerous tunnels is exceedingly grand. In one place the river has cut its way through a narrow channel in a perpendicular rock, and one can look down a

depth of a hundred feet or more to the river and upwards to a greater height still. We tried to get a photograph of it, but no one had been enterprising enough to take it.

We reached Cordova at midday, and remained there until the evening. We spent most of the time in rambling about the wonderful old cathedral there, which dates from the time of the Roman Empire, and is a mixture of Roman, Moorish, and Gothic architecture. From the top of the tower we got a good view of the town and the broad River Guadalquivir, and the ancient flour-mills built in the midst of it. We got a very fair white wine at a wineshop, but we found it rather strong and heady as compared to the ordinary red wines. After travelling all night we arrived early at Alcanzar St. Juan, about ninety miles from Madrid, in a high-lying part of the country. As we had heard that there are many vines grown about here we determined to stop the day before proceeding eastward to Valencia; so after coffee and cakes at the railway buffet we took a walk about the town. It is quite a different sort of place from the seaport towns, and is a collection of poor houses, ill-paved and crooked streets, very few footpaths, and no good shops or hotels, and not a bank in the place. The Church seemed to be the only building above the others. We had not provided ourselves with sufficient Spanish money on leaving Malaga, and here the ticket clerk at the station wanted to give us only twenty pesetas for a sovereign instead of twenty-five. The railway officials are said to be miserably paid and cheat and rob to make up for it.

We had not gone far before we saw loads of grapes coming in from the country, and following them up, we soon came to a large winemaking establishment. We entered and were lucky in finding a French gentleman superintending the winemaking for a firm in Bordeaux, who take all the wine as soon as made at a fixed price, sending their own casks from Bordeaux, and having it shipped from Valencia. The proprietor, a Spanish gentleman, and the Frenchman very kindly showed us round, and we were glad to find some one to whom we could speak. There were here two lagars paved with bricks, the largest about twenty feet by forty, the other about half that size. A passage of seven or eight feet wide between had a paved gutter of brick to take the juice from either lagar, through a wall to an adjoining cellar, which was partly underground. A man was pumping it with a rotary pump as it came through into butts placed three tiers high. The butts are filled so that they do not work over during the fermentation, and are kept filled up as it slackens. On one side was a row of earthenware jars holding nearly 500 gallons each, with wide mouths covered with a lid of boards coated with plaster of paris. We were told that the wine would be macked into them from the butts as soon as the fermentation was over,

and again into the butts when sent away. Two powerful presses of French make stood in the lagars. Drayloads of grapes were coming in, all in neat baskets holding about 1½ cwt., which were weighed as they were emptied into the lagars. Most of them were white; a few black ones were kept separate and put into a smaller lagar in the yard. The must was said to be 13, we understood by Baume. They very kindly offered to send a man to show us the vineyards near the town, and we gladly accepted the offer. In going out of the gates of the town we passed the funeral procession of a woman. The priests followed thus far, and then, after a halt and some prayers, they went into the town. We followed it to a walled-in cemetery a mile from the town, on our way to the vineyards. At about a mile and a half we came to the vineyards. The country is undulating, and quite destitute of trees of any kind, and the hills are covered with windmills. We counted twenty-eight from one spot. The soil is a deep sandy loam of a red colour, full of limestone in lumps; but no crust as with us. We found in some cuttings that the subsoil was also full of this and other kinds of loose stones mixed with the clay. The vines are all planted seven feet apart each way, and all worked by the plough. None of the ground had been trenched as far as we could see. Our conductor being a Spaniard we could not converse much with him. None of the vines are staked. The principal white grape he called "Rosano." It has a berry like the Donadillo, with a thick skin; but not the same growth, being more straggly. The next most grown is the Pardillo, bearing a thick clustery bunch. The red grapes he called "Tinto" and "Tinto Gordo," the latter very much like the Ullade, both in the berry and growth of the vine. The vines are kept low, and pruned very short, and rarely more than five or six spurs left on the vine. There are no fences, and as we were about to cross one of the vineyards a man with an old flintlock musket called on us to stop, but a peace-offering of a cigarette made all straight, and we went on. We came across several parties, mostly women, gathering the grapes. Two of them take a row and put their grapes into one vat and clear all as they go, except a few second crop, which are still green. The grapes are perfectly ripe, but not at all shrivelled. The people seemed very happy and fairly well clad. They were all very civil and offered us grapes to eat. We left them evidently amused, and were sorry we could not talk to them. We returned to the town about noon, quite ready for breakfast, our guide having taken us a good long round, and the clear bright air of the elevated country giving us a good appetite.

LETTER XIV.

WINE-MAKING AT ALCANZAR.—DIRTY IN THE EXTREME.—IRRIGATION BY "NORIAS."—VALENCIA.—RAISIN-MAKING THERE.—MANUFACTURE OF "MUSTELLA" OR SWEET WINES.

AFTER breakfast at the Railway Buffet, the only decent place we could find in Alcanzar, we visited the bodegas and wine manufactory of the Marquis de Mudella, which are situated near the station. We found no difficulty in gaining admittance, but could not find any one who could speak English or French. The place covers several acres, but is not very well arranged. Wine-making was going on and grapes coming in fast; from thirty to forty loads were waiting in the yard to be unloaded. There are several lagars, the largest about forty feet square, and paved with brick sloping to a point on the side nearest the cellars, and from there the juice flows through a low wall into a large cistern partly below the floor. From this it is pumped with a rotary pump, worked by two men, into the fermenting cellar adjoining. This cellar is about six feet below the surface, and is furnished with a long row of earthenware vessels holding about 500 gallons each; they have wide mouths, and are covered with boards plastered over with plaster of paris. In the lagar were four presses of French make. The crushed grapes are put into deep narrow circular cages made of wood and banded with iron, and after a very moderate pressure are pitched out through windows into an immense cemented tank, and trodden and rammed in tightly, and we supposed kept there until required for distillation. At one side of the lagar are two large windows or doors, at which the grapes are taken in and weighed with steelyards. The driver takes his weigh-note to the office and receives payment. Our friend in the morning told us that the price paid was 108 francs the ton. In the lagar were two mills with separators attached of Bordeaux manufacture, but they did not seem to get through many grapes with them, and about thirty men and boys were treading in the lagar at the same time; they all wore shoes made of esparto grass. At another part of the establishment was a smaller lagar made of wood, and here several men were treading red grapes, and taking out the stalks and picking them out by hand after treading. There was also another

brick-paved lagar being filled with white grapes. The cellars appeared to be pretty full of wine of previous vintages, contained in several large vats. There was a distillery, but the apparatus was very old and dirty, and did not appear to have been used lately. We found that the demand for the wines of this part of the country for the French market has opened up during the past few years, and many new vineyards are planted. Previous to this the wine was of little value here, and it is said that they sometimes used it to mix up mortar for building instead of water. Their method of making appears to us dirty and careless in the extreme.

After leaving here we interviewed the miller at one of the numerous windmills, and after the usual compliment of offering him a cigar he showed us all over the mill and the wheat he was grinding (a very poor sample), also the ground meal, and all with plenty of talk on both sides—none of which was understood by any of us.

We then went into a walled garden to examine one of the ancient "norias," or water-wheels, worked with a horse blind folded. The water is raised from a depth of twenty feet in earthenware jars of peculiar shape fixed on an endless band of esparto grass. The man in charge showed us round and tried to explain everything to us, and gave us some fine tomatoes. A few grapes grown here had to be tied up in bags to preserve them from the sparrows. The whole garden (about an acre and a half) is irrigated from the one well, but was not very well attended to. We tried some of the red wine at a wineshop. It was not so flat and strong as the Val de Penas, and we were charged a peseta, or 9d. per bottle for it. We also tried the pancakes, made in rings and fried in oil, and both cooked and sold in the streets, and found them very light and good. We left here again in the evening. At the first station saw another wine-making place of the Marquis de Mudella, and plenty of grapes still coming in from neighbouring vineyards.

OCTOBER 3.—We arrived at Jativa by daylight, and here we saw hundreds of butts of new wine at the station waiting to be sent on to Valencia. All were on the side, with a small hole in the shive to let the gas escape. Noticed that many of them were German spirit casks. We arrived at Valencia at 9.30, and after breakfast called on Mr. Gard, the British Consul. He told us that we ought to have gone to Denia to see the raisin-making, as most of the puddling raisins are made and shipped from there. However, as we could not go back to Denia, he told us where we could see some little of the process a few miles out. So we hired a trap and pair and took a man who spoke French. We paid two and a half dollars for the trap. As soon as we got into the country the roads were dreadfully cut up and dusty. After

crossing a plain all under irrigation, and growing among other things flax seven or eight feet high, and which was being retted and worked close to the road, we reached a village on rising limestone land. Here we saw people living in hovels dug out of the limestone rock. At about five miles we came to some vineyards, and turned off the road to visit the "hacienda" of a wealthy merchant of Valencia. It is situated among low limestone hills; in many places the stone is quite bare of soil, and nothing growing there but a few scattered carob-trees. The house is a fine building, with terraces in front, and overlooks the garden and vineyards, which are all in the hollows between the hills. The land is all trenched and levelled, with the large stones taken out to build walls to keep the soil from washing away. The vines are all planted at a distance of ten feet each way, and are all of the Gordo Blanco Muscat. There were a few of both first and second crop left on the vines, and we remarked how fleshy and solid they were. The vines are grown very low, the same as at Malaga, and a hollow made round each vine allows the fruit to hang, but much of it lies on the ground. No supports are used, and not more than five or six spurs, very short pruned, are left on each vine. The grapes are dipped in a boiling lye before they are laid out to dry. An iron boiler was set on a sloping piece of ground, and at the back and sides was a floor levelled and cemented, where the grapes are spread on frames made of small bamboos, about 7 feet x 5 feet, in size and fastened with crossbars of split bamboo on both sides, and tied through with esparto cord. There was a large shed full of them packed away. The raisin-making was finished and the crop under lock, so that we could not see any of them. The proprietor is having orange-trees planted among the vines in the best of the land, and they are watered every week from two wells about thirty feet deep. The water is raised with norias of English make, having iron links working over an eight-sided wheel, and carrying buckets of cast-iron holding about two gallons each. Several men were at work levelling a piece of land. They fill the earth into mats with the hoe, and carry it to where it is wanted.

There is a paved and walled channel to take the flood waters through the main valley; at intervals places are left in the walls to receive boards to dam back the water and flood the vineyard. A man who was building a raised channel for water said that the raisins were sometimes dried in three days. From here we went to a wine making place of another Valencia merchant; his son very kindly showed us round. The vines grown here are nearly all the Mataro, and are called the "Borena." They seem to suit the limestone country well. We saw no second crop on them like we often get. The winehouse and cellars are very substantially built of stone. The grapes are trod over large tanks

covered with loose boards fitting close together. When trod, and the stalks raked and picked out, they remove some of the boards and let them drop into the tank below. Spirit is then added in large quantities to make "Mustella," or wine used for sweetening dry wines. In one tank we examined the grapes were all sunk to the bottom, and on trying with a stick we could not find that they were kept down with anything; a few seeds were floating on the top, and the liquor tasted very sweet and strong. German spirit had been used, as we saw by the empty casks lying about. The pressroom, situated below the level of the fermenting tanks, had in it several French-made single screw-presses with cast-iron beds set nearly on the level of the floor; in front is a gutter in the floor which takes the juice from each press into another cellar on a lower level, where it is put into casks. The must from the presses is very sweet and strong, but has not much colour. They had made 600 hectolitres of sweet Muscat wine and sent it away to their bodegas in Valencia. We saw here several expensive mills, pumps, &c., all thrown aside after being tried and found not to answer so well as the simpler methods common in the country. Whilst the labourer is willing to work for fifteen pence a day machinery is not likely to be much used in this country.

LETTER XV.

PORT OF VALENCIA.—MODE OF CARTING WINE.—BENICARLO.—TARRAGONA; FINE BODEGA THERE.—WINES OF TARRAGONA.—CAROB TREES.—BEST WAY TO TILE VINEYARDS OF EUROPE.

ON our way back to Valencia we called at a small farmhouse on a hill overlooking the city. Here we found the family packing their raisins in mats, holding about 50 lbs. each. The stalk was not taken from them. They were very fine raisins, larger than any we make in Australia, very well cured, and bright in colour. It is a wonder to us how they can grow grapes to make such fine raisins on this poor limestone land; but it is only the hollows between the hills that are planted with vines, and they get all the water from the hills above them. On the hills are a few carob-trees growing among the bare rocks. We saw no burnt-up grapes on any of the vines. The foliage is very scanty, and we inferred from this that the sun is not so scorching

as it sometimes is in Australia. We made enquiries if fruits such as apples ever get roasted on the trees, but could not hear that they do. We were shown by the good wife the implement used for dipping the grapes in the boiling lye previous to drying. It is a round basket made of strong wire, and fixed on a long handle. It would hold about 20 lbs. of grapes. The people here seemed very much interested to find we came from Australia, and offered us refreshments.

Next morning we took tramcar to the port, about three miles, the road all the way shaded with rows of fine plane-trees. A large quantity of wine is sent from here in small steamers to French ports, especially to Cete and Bordeaux. It is all lifted into barges with block and tackle. The wharfs are blocked up with empty wine butts, many of them without bungs. Some were quite sour, others smelled strongly of spirit. The wine is carted from the stores and railway to the wharfs with two-horse drays made for the purpose. The load, of two butts, are slung below the bed with chains, and are raised about a foot from the ground with a windlass fixed at the back and another at the front of the dray; one man can thus handle them easily. Saw several loads of wine just in from the country, the teams and men covered with dust. They have usually four mules in the team, and the load consists of two butts slung below the bed with chains, and three on the top; the wheels are very high and light, and lean over very much.

Close to the city is the broad channel of the Guadalquivir; a very small stream of dirty-looking water meanders along the bed, and the smell from it is most abominable. How ever the people can walk and sit on the rambla alongside we cannot think. Across a fine bridge is an Exhibition now on; we visited it on the evening of our arrival, but as we had been two nights on the railway we were very tired and did not remain long. There were a good many exhibits of wines and liquors, casks, and coopers' ware and tools. Around one of the wine exhibits were several vines with the fruit on them, to show the kinds, but the foliage was too much withered for us to recognise the kinds.

October 4.—Left Valencia at 12.30, and travelled all the afternoon along the coast through country planted with orange and lemon trees in the irrigated lands, vines and mulberries on the higher land, and the olive and carob tree on the poor and stony rises. The grapes were all gathered except a large heavy-bearing black grape. At Benicarlo we lost sight of the sea and got among limestone hills; here the land, except the bare rocky hills, is all terraced to keep what little soil there is from washing away, and planted with vines. They appeared to be nearly all the Mataro, and are grown without support and look fairly healthy, but with rather scant foliage. We saw a few patches with a

dark-red leaf, which we took to be the Carignan. We saw many patches of newly-planted vines, and ground being made ready for planting; long holes are dug to receive cuttings laid in horizontally. Every station we came to was blocked up with butts of wine and empty casks. It was nearly dark when we reached Tortosa. The Ebro, which we crossed here, is a fine river, and looked as broad as the Murray. From here to Tarragona we saw nothing.

October 5.—After an early breakfast we visited the bodega of Messrs. Ransome, Muller, & Bagot, one of the largest in Tarragona, and one of the largest that we have seen yet. It is divided into six bays by lofty brick pillars, and covers over an acre of ground, and is of one story and all above-ground. In one bay was a row of 1,000-gallon casks, and on the other side vats of 10,000 gallons each, with a roadway over the tops of them. There are several large tanks below ground, and between every two of them and close to the wall is a small one about six feet square, with a pump to each fixed to the wall and worked by hand. The large tanks are run off into the smaller ones, and pumped away as required. We looked into one of the small tanks; it was lined with white tiles, and a man was in it cleaning up a little wine left below the suction-pipe. There was a large stock of wine in pipes and butts, also several large iron tanks full of spirit. The spirit used here now is all from Germany. The price of the common wine that used to be distilled has risen from 15 pesetas the hectolitre (about 6d. per gallon) to 30 and 40 since the demand for these wines for France has set in. We were shown many wines here. Ordinary dry Tarragona red, under 26°, unfortified, deep in colour, and rough on the palate as if all the stalk had been fermented—this is shipped at £11 per pipe of 125 gallons; sweet Tarragona or Spanish Port, at £12; sherry, much inferior to our new Angaston wines—this is shipped at £12 per butt of 108 gallons. We also saw a dry full-bodied white wine, like a dry Verdelho; it was said to be under 26°. We were not shown any over a year old. We were told that they hold a large stock in the growers' cellars, and have it down as required. The bulk of the red wine is made dry and sweetened afterwards with "mustella." They send their own spirit up to the vineyards and have this article made for them. The bulk of the wine shipped at Tarragona is made at Lerida, some thirty or forty miles inland from here, and the vintage is already over, and we fear if we go there we shall lose the vintage in France. We had no introduction to these people, but they very kindly gave us all the information we asked for. We afterwards took a walk of a few miles into the country; as far as we went it was a thin light soil on limestone, and if the shenoaks at Edinborough could be changed into olive and carob trees it would be almost like this

country in appearance. Further on we could see a fine irrigated valley; we saw three men gathering carob beans near the road, one man was in the tree knocking down the beans with a bamboo. We understood from them that the crop was a poor one, we judged there was not more than 30 lb. to a tree. The beans were quite dry, but hung very tightly, and took a deal of hammering to detach them. The trees seem to grow on the bare limestone rocks where scarcely any soil is to be seen.

Just outside the town a new bull-ring is building of brick. It has twenty rows of seats all round next the ring uncovered, and ten or twelve above, covered with an iron roof. There is a fine breakwater and a pretty good harbour for small steamers, but all the wine is taken off to them in barges or lighters. The town is old and the shops very poor, and the streets dirty and the people also. We visited the early market near a fine old cathedral, and saw many curious things exposed for sale—dried mushrooms in large quantities, vegetable narrows just formed, and kids taken out of slaughtered goats, clothing of all kinds spread out on the flags, and fish, sausages, and pancakes cooking in the open air. We were sorry we did not get here a fortnight earlier so as to have seen the vintage. The wines here have a great similarity to many of our Adelaide wines in colour, body, and flavour. Any one travelling to see the vintages in Europe ought to land here, as this appears to be earlier than any other part of Spain. They could then visit the raisin-making districts of Denia and Malaga, see the vintage at Val de Penas and Alcauzar and get to Xeres in good time, and be on the Douro in ample time for the port wine vintage, and then on by the railway into France via Biarritz to Bordeaux. Then on to the Burgundy country, and from there to the champagne districts, and into Germany in time for the late vintages on the Rhine, which is as late as the end of October. The only important part left out in this programme is that of the Herault in the south of France, which is worth visiting, although no first-class wines are now made there since the phylloxera has made such ravages.

LETTER XVI.

TARRAGONA TO BARCELONA.—LARGE WINE STORES.—IMMENSE VATS.
GRAIN DISTILLERY.—PERPIGNAN.

STARTED early for Barcelona. Just as we were leaving the station, and before the train got into full speed, a prisoner, who was working with a gang close to the rail, jumped on to the step of the next carriage and close to the compartment we

were in. A soldier guard posted on the bank above fired two shots at him; the first went through the step of our carriage, and the second brought him down, and we saw several men carrying him away as if dead.

From Tarragona for many miles the soil is still the same as before described, but at Villafranca the solid limestone gives place to a soft kind, often at great depth, as we could see in the railway cuttings, and terracing is not practised. The soil appears richer and the vines much stronger; they still seem to be principally the *Mataro*. In some vineyards pruning has already begun, and in others goats are turned in to browse on the foliage. We only saw two ploughs at work in vineyards during the day, but men were already digging over the vineyards with hoes.

Towards Barcelona the land is very hilly, but every available spot, even the steep cuttings of the railway, are planted with vines. The population of the country all the way from Valencia appears very dense as compared to the corn-growing districts, and shows what the vine, olive, and such like plants do for a country.

The mountains, which are in sight nearly all the way, look very barren, only a few carob-trees growing on the lower spurs. We cross many dry watercourses, but wherever water can be obtained there is plenty of everything growing.

We got to Barcelona in the evening and next day (Sunday) attended service of the English Church in an underground room at the American Consulate. Afterwards went up the mountains until we got a splendid view of the town and harbour and the irrigated plain below us. The lower hills are all planted with vines. The soil still contains much decomposed lime. We went through several vineyards without any hindrance, but the crop was all gathered. Went to a circus in the afternoon, and found it crowded with people. A fine rambla in the centre of the town, shaded with four rows of plane trees, is the favourite resort in the evening, and the people are said to pass much of their time here.

Next morning we visited several of the large wine stores on the outskirts of the city. They are mostly near the railway, and some have branch lines running into them. One of the best we saw was a building not quite finished, the floors being laid with concrete. There were three very large tanks below the floor, with suction-pipes running from a steam pump to each of them; over each tank is a small cylinder about six feet long and eighteen inches wide, and the bottom sloping from a few inches at one end to a foot or more at the other, and lined with glazed tiles. The bottles of wine are rolled on to these to be emptied. Above ground is a row of very large vats, all of one size and mounted on walls three feet high. A copper pipe of three inches diameter

from the steam-pump is taken along the walls, and a branch from it to every two vats. By simply turning over the bent end of this branch the wine is delivered into either vat as required.

The largest cellar we saw was 31 paces wide by 42 long, the roof of iron of one span without any intermediate supports. In it were two vats of 50,000 gallons each—by far the largest we have yet seen—two of 30,000, and eight or nine of 15,000; also several underground tanks with copper pipes leading to all of them from a steam-pump. In all the cellars we saw filters with double calico bags, the inside one larger than the outside. We also saw a man blending wine in a large vat by plunging a long pole with a perforated board at the end of it. Very little is doing in the cellars except sending away empty butts; up the country for the new wine, very little of which has come in as yet. We afterwards visited a very large grain distillery, said to be the only one in Spain. They operate almost entirely on maize imported from America. It is ground and steamed, and afterwards mashed in large oval vats of wood; the mash is cooled in them with a moveable coil of flat copper pipe before the yeast is added. After about seventy-two hours it is pumped away to the stills, of which there are four, two of French and two of German make. The largest will turn out 600 litres per hour of strong spirit, and when in full work they can turn out 4,000 gallons in the twenty-four hours. The price of first-class spirit was said to be about 2s. 10d. per gallon. The refuse of the spirit is given to about 400 pigs, about half of which were Berkshires, and the rest Catalans with long legs and snouts. There was a hospital for sick pigs, and a few were quarantined for biting the others' tails off. About forty dry cows were fed with the refuse in a well-arranged stable; they get a little lucerne hay with it, and are said to fatten very rapidly. We were obligingly shown over this interesting establishment by Mr. B. Naas, a young German, who called himself the technical director of the distillery. We afterwards saw the cemetery, where the dead are all buried above ground in ovens seven tiers high. In the centre of the spaces enclosed by these singular tombs are many magnificent ones of the wealthy, often with a small chapel in them.

The old part of the town is very interesting, the streets very narrow, but the shops well filled and plenty of business doing. This is the busiest place by far that we have seen on the Peninsula, and we wished to see more of it, but we have to hurry on into France.

OCTOBER 9.—Started at 5 a.m., and got to the frontier at 11. The land after leaving Barcelona is mostly sand and gravel, and no more lime is seen. As soon as we got into France we began to see what ravages the phylloxera has made. At Banyuls-sur-mer and Port Vendres the steep hills are terraced to the very tops,

but the vines are nearly all killed; here and there are a few sickly-looking stragglers. As we got near Perpignan they got better, and on the plains near the town they appeared very healthy, and with a heavy crop on them. We got to Perpignan at 1.30, and went to the office of the Messrs. Durand, who are bankers and vineyard proprietors. They were not in, and the clerk did not seem inclined to help us much. We were debating whether to go on to Certe at once or not, when a gentleman, who was in the office and heard what we wanted, spoke to us and kindly offered to send his clerk with us to see some places where wine-making was going on. We found out that he is the Spanish Consul, and his clerk, Mr. A. Calonge, had been some years in Canada, and spoke good English. He took us to a small place in the town, but they had finished wine-making, and we ascertained from him where to go next day. We afterwards spent an hour or two with him seeing the sights of this interesting old town. A noble rambla a mile long, shaded with four rows of enormous plane-trees ninety years old, is quite close to the town; a small river runs through the town, and over a hundred women were washing linen in it, and the smell from it was anything but agreeable. After dining together our kind guide gave us his experiences of life in Canada and the States, but, like all Frenchmen, fully believes that there is no country equal to his own. He thought that a few practical men from the parts devastated with the phylloxera might be got to emigrate to Australia, but generally they are very much against leaving their country.

LETTER XVII.

ST. NAZARRE.—M. ESCARRA'S VINEYARD AND WINE-MAKING CELLARS AT PERPIGNAN.

OCTOBER 10.
AT 6.30 a coach which we had ordered came for us and took us to St. Nazarre, through vineyards nearly all the way, about nine miles, to the farm and cellars of M. Escarra. He is one of the largest proprietors in this neighbourhood, and has 450 acres of vines, and large cellars, house, and offices. He was away from home, but one of his sons received us very kindly, and took us all over the cellars and vineyards, and gave us all

the information we asked for most readily. We had no introduction, but the fact of our being vinegrowers from another part of the world seemed quite enough.

We first visited the cellars, and found the last of the grapes coming in. They are brought in in deep tubs with two handles, and containing about a hundred-weight each. The drays are backed up to a platform at one end of the cellar, which is on falling ground, and there put on a low truck running on rails, and through a doorway to a kind of gallery built over the fermenting casks.

There are here twenty-seven casks holding 10,000 gallons each, thirteen on each side and one at the upper end. There is a trap-door in the floor over each cask, and the mill (an ordinary fluted-roller one, worked by hand) is placed over it, and the grapes are crushed and fall into the casks below with all the stalks; with every tubful of grapes a handful of plaster is strewn over them as they are emptied into the mill. Although the last of the grapes are coming in they are not at all shrivelled. There are a good many rotten ones among them, but we could not find any burnt-up grapes. There is no means used to keep down the skins, &c., in the vat, but a large iron funnel with a spout to it is fixed in the manhole on the top of the cask after it is filled, and a shute conveys the yeast as it works over down into a large tub on the floor; the juice that works over with the yeast is pumped back into the vat as soon as it can be done. The grapes are usually allowed to ferment fourteen or fifteen days before the vats are drawn off; but this year, owing to a good crop, they had to draw off a little sooner. The vat they are filling to day was filled the first time on the 3rd September and drawn off on the 15th, and filled again the second time a day or two after.

In an adjoining cellar are three large screw-presses, each with a single screw in the centre. On the top of the screw is a wheel of five or six feet diameter carrying the hut. A groove round the edge carries a rope several times round the wheel, one end of which is taken to a crab-winch, which serves for all three presses.

After the marc is pressed the press is raised, the cheese is pared down with long knives and piled on the top and pressed again, and the pressings mixed with the wine drawn off. The contents of the first vat drawn off was in a yard adjoining the cellar—in butts, with a flat stone over the bung-hole of each. M. Escarra said it would be rolled into the cellar and pumped into a vat as soon as they could find room, and that it would settle down again without any injury to the wine. We tasted several of these butts and found the wine very rough and deep in colour but light in body, and very inferior to our Mataro wine we make at Tintura. They have sent away a good deal of the new wine already to make room, and the whole crop is already sold for

28. francs per hectolitre, or about a shilling per gallon. The vineyards are slightly undulating, and the soil a deep free-working sandy loam, with more or less gravel, and the subsoil a light-coloured red clay, with traces of lime in it. The vines grow very strong except in the very gravelly land, and are planted at five feet apart each way, and all worked by hand labour. The crop varies from 350 to 700 gallons to the acre.

The kinds mostly grown are first the Carignan, next Mataro, and then Grenache. Grenache wine is said to lose colour in keeping, but M. Escarra said that did not matter, as all their wine is sold and used within the year. The vines are all spurned and grown as bushes without any stakes, and they are not topped during the summer. M. Escarra said it would do no good to do so. We looked among the vines for burnt grapes, but could not find any, and infer from this that their climate is not so severe as ours, and that we must still continue to top our vines to give shade to prevent the fruit from burning up.

The phylloxera is here in spots, and M. Escarra is treating it with sulpho-carbonate of potassium, and washing it in with water pumped on to the vineyard with a portable steam-engine through iron pipes. They have been able by this means to check the spread of the pest, but are afraid to lay out any more money in cellars and casks.

The country all the way from Perpignan is undulating and very pretty. Some of the vigneron are already digging the vineyards; they first roughly top off the shoots with billhooks to get between and about the vines. Others are manuring the vines by opening a trench between the rows about a yard long and six inches deep; in this they place a little fresh cow manure, all the small cuttings and weeds about, and then draw back the earth again with the hoe to cover it. On returning we made a detour to see some of the irrigated land near Perpignan. It is very fully cultivated with all kinds of fruit and vegetables. We saw no old peach-trees, and were told by our driver that they renew them every ten or twelve years. They do not prune them much. The land is very valuable, and M. Calonge said £200 per acre, and very seldom any of it for sale.

After a late breakfast we went to the cellars of M. Escarra, in the town and near the railway station. The son, who attends to this part of the business, was out, but the cellar-man showed us round. There are sixteen casks in one cellar, ranging from 9,000 to 10,000 gallons each. In answer to our enquiries, he said that they never use water to wash out these casks, but take wine for that purpose, and that the casks would go mouldy if they used water. They sulphur them well every two months when empty. We noticed the bag-filters here like we saw in Spain. We next visited the cellars of Itynes & Andossan. They have in one

cellar thirteen vats of 14,000 gallons each, and in another detached cellar ten of 5,000 gallons each. These are filled or emptied through a copper pipe running beneath the vats from a pump worked by a gas-engine at one end of the cellar. The pipes are laid at a regular incline so as to drain thoroughly, and taps are placed so that any one vat can be filled or emptied as required. This is the first time we have seen this arrangement for filling from below, and it is said to answer perfectly well. The new wine is coming in here, and 12,000 hectolitres have been already received. The foreman here got the keys and took us to a small cellar, where there are ten or twelve butts and a few small casks of old wines. Among them two wines of the best Rousillion type from Banyuls-sur-mer, and thirty years old; they were like a very old Port. Also a very old Grenache, quite yellow, and a Muscat of Rivesaltes ten years old, both very luscious and high-flavoured. He also showed us the ordinary red wine of the country a year old, such as they are sending away. It is very thin, and not at all equal to our Tintara wines. He said that all the fine hill vineyards that used to produce the fine Rousillion wines are destroyed by the phylloxera.

We next visited the cellars of M. Savary Villar. They are much in the same style as the others, and the vines much the same. We were shown here a vat of wine made at the proprietor's own vineyard. It was deeper in colour, and better than the ordinary red wines. We enquired if they kept these large vats always full. They said they did as far as they could, but if on ullage they are frequently sulphured.

The last cellar that we saw was that of A. Fric & Co., close to the railway station, and they have made the most of their position. The offices and cellars are entered through a grand archway, with the name of the firm in gold letters, then through a yard planted with shrubs and flowers, and in front of the offices a broad skeleton verandah of iron, covered with vines and creepers. The cellars are beautifully clean and well kept. They very kindly showed us many of their wines, among them some hill wines, which would very well take the place of Port, being very full-bodied, but not sweet. In all these cellars they use rotary pumps and hose for racking. We were not sorry that we stopped here, as we should have missed seeing so much if we had gone on yesterday.

LETTER XVIII.

OETTE, CELLARS THERE.—CHAUVAIN'S CELLARS, MANUFACTURE OF VERNMOUTH.—FLORENSAC.—M. RICARD'S VINEYARDS.

OCTOBER 11.

OETTE.—Arrived here late last evening, and took up our quarters at the Hotel Grand Gallions. Early this morning we took a turn round the town and docks. We saw men building large blocks of stone and cement for harbour works. After breakfast called on Peredier Feres, & Co., to whom we had an introduction from P. B. Burgoyne & Co., of London. None of the partners were in; but the head cellerman showed us round. The cellars are large, and of two stories, the upper one quite in the roof, and is only used for old wines. The new wines are stored in twenty casks containing from nine to 10,000 gallons each, set up on walls about four feet from the floor; the space underneath is used for stowing empty butts. A gas engine works a treble-action pump, and the wine is pumped up into an iron reservoir near the roof, and from this it is conveyed in tinued copper pipes along the walls to each cask. There is very little wine now in the cellar, and the new crop has not yet begun to come in, and they do not expect it for another month.

Next called on H. Benesch, who has a fine and well-kept cellar with twenty-seven large casks. He also uses a pump worked by gas-engine and india-rubber hose of three inches in diameter to convey the wine from a reservoir set on the second floor to the casks. The hose are kept from getting sour by washing them with water after use. Empty casks are kept sweet by sulphuring them every fourteen days; from fifteen to twenty matches are used each time for a cask of 10,000 gallons. These matches are purchased ready made, and are seven to eight inches long by an inch broad, and very thick with sulphur. The wines are fined with dried blood, got from Austria; it is very effective, but takes a good deal of colour out of red wines. We saw here a little old wine evidently kept as a curio; it was said to be thirty years old and like an old Madeira. A large trade is done here with the interior, and steamers are arriving daily with wine from Spain and Italy, and they are blended with the thin wines of the neighbourhood. From the pumps a suction-pipe is carried across the street to the canal in front for the purpose of seasoning new

cellar thirteen vats of 14,000 gallons each, and in another detached cellar ten of 5,000 gallons each. These are filled or emptied through a copper pipe running beneath the vats from a pump worked by a gas-engine at one end of the cellar. The pipes are laid at a regular incline so as to drain thoroughly, and taps are placed so that any one vat can be filled or emptied as required. This is the first time we have seen this arrangement for filling from below, and it is said to answer perfectly well. The new wine is coming in here, and 12,000 hectolitres have been already received. The foreman here got the keys and took us to a small cellar, where there are ten or twelve butts and a few small casks of old wines. Among them two wines of the best Rousillon type from Banyuls-sur-mer, and thirty years old; they were like a very old Port. Also a very old Grenache, quite yellow, and a Muscat of Rivesaltes ten years old, both very luscious and high-flavoured. He also showed us the ordinary red wine of the country a year old, such as they are sending away. It is very thin, and not at all equal to our Tintara wines. He said that all the fine hill vineyards that used to produce the fine Rousillon wines are destroyed by the phylloxera.

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LETTER XVIII.

CETTE, CELLARS THERE.—CHAUVAIN'S CELLARS, MANUFACTURE OF VERNMOUTH.—FLORENSAC.—M. RICARD'S VINEYARDS.

OCTOBER 11.

CETTE.—Arrived here late last evening, and took up our quarters at the Hotel Grand Gallions. Early this morning we took a turn round the town and docks. We saw men building large blocks of stone and cement for harbour works. After breakfast called on Peredier Feres, & Co., to whom we had an introduction from P. B. Burgoyne & Co., of London. None of the partners were in; but the head cellarman showed us round. The cellars are large, and of two stories, the upper one quite in the roof, and is only used for old wines. The new wines are stored in twenty casks containing from nine to 10,000 gallons each, set up on walls about four feet from the floor; the space underneath is used for stowing empty butts. A gas engine works a trouble-action pump, and the wine is pumped up into an iron reservoir near the roof, and from this it is conveyed in tinued copper pipes along the walls to each cask. There is very little wine now in the cellar, and the new crop has not yet begun to come in, and they do not expect it for another month.

Next called on H. Benzsch, who has a fine and well-kept cellar with twenty-seven large casks. He also uses a pump worked by gas-engine and india-rubber hose of three inches in diameter to convey the wine from a reservoir set on the second floor to the casks. The hose are kept from getting sour by washing them with water after use. Empty casks are kept sweet by sulphuring them every fourteen days; from fifteen to twenty matches are used each time for a cask of 10,000 gallons. These matches are purchased ready made, and are seven to eight inches long by an inch broad, and very thick with sulphur. The wines are fined with dried blood, got from Austria; it is very effective, but takes a good deal of colour out of red wines. We saw here a little old wine evidently kept as a curio; it was said to be thirty years old and like an old Madeira. A large trade is done here with the interior, and steamers are arriving daily with wine from Spain and Italy, and they are blended with the thin wines of the neighbourhood. From the pumps a suction pipe is carried across the street to the canal in front for the purpose of seasoning new

casks with salt water. Everywhere one sees rows of butts ranged alongside the canals (which intersect the town in various places), being filled with salt water by men who bale it up with a bucket fixed on a long pole. It is allowed to remain in them about four days, and they are then rinsed with boiling water. Next called on Mr. G. Espitalier, the British Consul, respecting getting a few men to emigrate from this part. He thought there would be great difficulty in getting good men, as they earn 5 francs a day, and foremen in cellars much more than that, and they are very loth to leave their country. He very kindly took us to a cellar near his office to taste some Algerian wine. It was poor, thin stuff, and very astringent, and we did not think much of it. He then took us to the cellars of M. Chauvain—the largest manufacturer of Vermouth in France, and who has by far the finest cellars in Cette. They are situated near the railway station, and are nearly new. They are entered through massive doors, past offices on both sides, into a large yard floored with cement, and roofed with glass. This yard is now empty, but in the summer is filled with wines in butts to get the heat. There are six lofty cellars all opening into one another and into this covered yard, and in them are no less than 130 casks of 11,000 gallons each. They are all of 4-inch oak and well hoops, and set up on dwarf walls a good height from the floor, and have galleries running along over the tops of them all. They cost set up 7 francs per hectolitre, or a little over 3d. per gallon. There are copper pipes from a steam-pump, like the fargee pump, to every cask, and the pipes, taps, and brass fittings are said to have cost over £4,000. The stock of wine on hand is not less than one and a half million gallons, and is all white wine, and made into Vermouth; and M. Chauvain is said to have made an immense fortune out of it in ten years. The whole place is nicely kept, and one man does nothing else but keep the brass taps clean.

OCTOBER 12.—Went by rail to Florensac, a small village near Cette. We found here a small proprietor, M. G. Gelly, who has a brother in Adelaide. He received us very heartily, and took us round to various places in the neighbourhood. We first visited the vineyard of M. Louis Ricard, who is one of the largest proprietors here, and owns 250 acres of vines here and another vineyard near Marseilles. They were here still gathering grapes and making wine. The vineyard is all on the flat country near the River Herault, and the soil is a rich alluvial loam, and the vines are planted about five feet apart each way and grow very strong, and are apparently all worked by hand labour. A pretty large party of vintagers—mostly women and girls—were at breakfast when we got to them, but they soon started to work again and began to sing. The women were mostly old, and very few good-looking ones among them. They all wore broad-brimmed

straw hats. The grapes are carried by men to the carts, which are like those used at Cette for moving wine, with temporary bottom and sides put to them for the vintage, and a tarpaulin laid to receive the grapes. The kind they were gathering was the Bourret, a whitish grape with a brown tinge, and a very heavy bearer. There is also the black Bourret and the Aramon, a large black grape with a thick skin, and very late; it also is a heavy bearer. The Carignan and the Tinturier are considered the best grapes. The leaves of the latter are turning off very red, and it is rather a straggly grower. At the cellars we found M. Ricard sitting talking to the men, who were at breakfast. He excused himself from going round with us, as he is paralyzed, but sent a man with us. In an inner cellar we found twenty casks in two rows of from 9,000 to 11,000 gallons each cask, and a similar lot in another and larger cellar, and preparations making for setting up more. About the centre of the cellar are three large stone-built tanks, all above ground, and used for fermenting the red wines. The dryloads of grapes go up an incline and over a strong board floor on the top of the tanks. The grapes are crushed in an iron roller mill, with teeth like those of a hand-saw, and fall through trapdoors into the tanks below. They were unloading a dryload of white grapes into a shallow cistern of wood, and men were shovelling them into the mill, which took two men to work it. From the mill the crushed grapes passed down into another cistern on the ground floor, and around it are several old-fashioned presses. The beds of the presses are of very heavy timber, and from seven to eight feet square. The presses are worked with a jerk when well down. The skins, after pressing, are sent to a distillery in the village. There is an old still in the place, but it is not now used. The wine is already all sold 25 francs the hectolitre, or about 1s. per gallon. The red wines are fermented with all the stalks, and remain in the tanks for eight or ten days, and are then drawn off into small tanks lined with white tiles below the floor, and pumped from them through copper tubes, which are fixed to the walls, and lead to the casks in the several cellars. Very little care seemed to be taken, and dirt and disorder and a strong smell of lactic acid pervaded the whole place. The Terret Bourret, said to give sometimes as much as 1,500 gallons to the acre, and I should think there would be from 800 to 900 on what we saw gathering; and at the price got for the wine it must be a very profitable business.

After thanking the proprietor, we went to the banks of the river to see the way the water is raised to inundate this and some other vineyards. The river has a substantial dam or weir thrown across, and a fall of seven or eight feet is obtained, and a turbine raises it to the surface through an 18-inch pipe, and it is then

conveyed away in raised ditches to the vineyards. They are flooded for thirty or forty days during the winter, and this has been done now for four years and proved a certain cure for the phylloxera. We noticed in the middle of the vineyard a small hillock which cannot be flooded, and on it the vines are nearly all dead.

In some places steam pumps are used for raising water for inundating the vines, and everywhere it is possible to inundate fresh vineyards are being planted, and on the hills American vines grafted to French sorts. They evidently do not intend to lose the vine hereabouts.

LETTER XIX.

FLORENSAC, DISTILLERIES THERE.—GRAPE-SKINS FROM SPAIN.—
RETURN TO CETTE.—WINES EXPOSED TO THE SUN THERE.

AT Florensac there are to be found several small distilleries, and we were taken to some of them. At the first one we visited they were operating on a material called "Clausette," It is a fruit like a small date, and is imported in mats from Bombay. The still was a continuous one, and the spirit was running off at 85° by Cartier. It was far from a pure spirit, and the place was ill-arranged and dirty. In the next they were distilling from the marc of grapes. There were two large vessels of copper in which the marc is heated with a steam coil at the bottom, similar to the wood vats we saw used in California for the same purpose. One of them is distilling whilst the other is being emptied and filled again. The spirit running off was the most horrible stuff I ever saw, and the smell of it hung about our hands all the rest of the day, and to our handkerchiefs for a day longer. The marc is brought in from the wine-making places and stacked up in large heaps under cover and well trod. After it leaves the still it is carted away and stacked up again out of doors, and fed to sheep and cattle during the winter. We then visited the distilleries and cellars of the Mayor, M. Dental; nearly all his casks were empty, as very little wine is now distilled. The still is on the same principle as those made by Linde, of Adelaide, and will turn out a hectolitre of spirit per hour of a strength of 85° Cartier. They had just finished distilling from wine, and the still was yet warm. The spirit was

fairly clean and very different from the marc spirit. We then visited the cellars of M. Villiotte, who has a fine chateau in the town. The cellars are lofty and well built of stone, and well furnished with casks of a large size, but all empty, the phylloxera having destroyed nearly all his vineyards. We saw several large disterns built of stone for fermenting, and several old-fashioned looking presses; but, being near dark, we could not examine them very minutely. We were shown a piece of vines near the railway of five and a half hectares which was sold last year for 25,000 francs, or £70 per acre. It was on flat country, and capable of being put under water. The vineyards hereabouts do not succumb to the phylloxera so quickly as in poorer land, and a vineyard was pointed out which had been attacked ten years ago and was still in partial bearing. The pruning is all done here with two-handed scateurs, one blade having a cutting edge at the back, which is used to chop off the small shoots and suckers growing from the base of the stock. The wines grown on these plains are very thin, and contain only 7 or 8 per cent. of alcohol, or from 12 to 14 of proof spirit.

We had for breakfast Aramon wine of the previous vintage, very thin and hard, but sound, and it quite amused us to see the quantity of it drunk by both the young and old during the meal, and the way they seem to enjoy it. At the railway station we saw quantities of puncheons, quite blocking up the place. On enquiring what they contained, we found that they are filled with grape-skins in Spain and which are sent here to be worked over again; and at Adge, another town on our way back to Certe, we saw large vats of them fermenting out of doors near the station.

The skins of the Spanish grapes are found to contain more colour and other qualities than those grown here, and are said to be fermented over and over again with glucose, and are afterwards strengthened with German spirit, and sent away to Certe and Bordeaux to be made into cheap clarets.

OCTOBER 30.—We got back to Certe by an early train, and walked up to the top of the hill above the town, from whence a grand view is got of the town and the lake and country round for many miles. The town is one of the most prosperous in France, and since the phylloxera the trade has increased immensely. Steamers are arriving from Spain, Italy, and Greece daily laden with the wines of those countries, which are here blended with the wines of the neighbourhood, and then sent all over France, and a small proportion shipped to America and other countries. Property has greatly increased in value, and the Consul pointed out several stores near his office on one of the wharfs which are let at 5 francs the square metre, and four years' rent paid in advance to enable the proprietors to build.

During the day we visited several more cellars. At one of

then that of Esteve & Sinot, we found an apparatus for heating wines. It is a vat containing 100 hectolitres, or about 2,200 gallons, heated with a steam coil at the bottom. It is fixed on a stage high up, and above it is another of the same size, into which the wine to be heated is pumped up with a steam-pump, and from it run down into the heater as required. They said they only heated *sick* wines, and never those that were sound. At the cellars of M. de Jaen, who very kindly showed us round himself, we saw a large yard full of butts of wine marked Madeira stocked up two or three tiers high. He said it is put out here in the sun to get age at two years old, and remains from two to three years; also that the evaporation is at the rate of 8 per cent. per annum.

We noticed in the cellar on the crossbar in front of many of the large casks a small wide-mouthed clear glass bottle filled with white wine, and covered with a piece of card. He said it was done to try how the wines stood the air.

The large firm of Money, Pratt, & Co. have several acres of land near their cellars covered with butts of wine, all stacked in single tiers, with narrow gangways between. There are also a row of large casks painted black to attract more heat, but the butts are not painted, and looked very old and weather-beaten. They are all shivered up, but on sounding them we found a considerable ullage. Several men were at work racking off and pumping the wine into the large casks. They run off four butts at a time into the pump tub with tin syphons. The wine is strong and high-coloured for white wine, and it has to be of a strength of 26° proof to stand this treatment, and is fortified up to that if required. It is used in the manufacture of Vernonth and in making up imitation wines, a trade for which Cote is notorious. The wines are all carted about here with vehicles, which are merely a long pair of skids on high wheels. A couple of good horses take seven butts, which are held in their place with a strong rope, which is tightened up with a roller fixed to the shafts just behind the horse.

We called again on M. Espitalier, the Consul for England. He is quite willing to act as emigration agent if required, but does not give much hopes of inducing people to go to Australia. He said that he had a great difficulty to get a man to go to Italy to manage a vineyard for an English gentleman, and as soon as his two years' engagement was up he threw up the place of £200 a year and returned to work as a labourer in his native village.

OCTOBER 14.—Started early for Bordeaux. Between Cote and Aigle the land is low and sandy, and not much above the sea, yet every available spot is in vines; further on the land is better, but here the phylloxera has made sad havoc, and large heaps of vine stumps, piled up near the houses, are all that remain to show

where once had been thriving vineyards. And yet they are planted again in all directions, especially where water can be raised to inundate the vines. At Narbonne we missed our train through a mistake, and had to wait several hours for the next, but found our luggage all right at Carcassonne when we got there. There is a marked difference in the railway accommodation and in the civility of the officials in France as compared to Spain and Portugal. From Carcassonne onward the cultivation is more mixed, and continued so as far as Agen, when it became dark, and we saw no more of the country that day, and got to Bordeaux late in the evening.

LETTER XX.

BORDEAUX.—CELLARS OF N. JOHNSTON AND CO.—WINE-MAKING IN THE MEDOC.

OCTOBER 15.

BORDEAUX, the great wine centre of France. Called on Nathaniel Johnston & Co., and saw Mr. Clos, the senior partner, and Mr. Johnston, jun., who took us to their cellars, at some distance from their offices. The cellars are very old, some part of them 150 years, and are all below ground. In these are kept the old wines in hogsheads and large stocks of claret in bottle. The temperature was 15° centigrade, and never varies much. In one cellar was 10,000 bottles of Chateau Latour of 1878, and in another 30,000 of Lafite of the same year. The cellar walls and roof are covered with a thick coat of mould, and it may be seen running over the bottles in stack, and the casks are also covered with it. All the casks containing old wines are turned with the bung on one side. The old head cellarman brought us in the tasting-room samples of some of the finest wines, both claret and sauternes. They do not keep samples of the wines sent out here as they do at Oporto and Xeres. Mr. Clos told us that the trade with Australia had greatly fallen off during the last few years, and wanted to know the reason. He said he had tasted many of the Australian wines sent to the late Exhibition in Bordeaux and found many of them very good, but remarked that the older wines were not so good as the younger, and concluded from this that they had not been well kept and managed. He said that all the fine Bordeaux wines are racked every three months the first year, twice the second, and once a

year afterwards; also that five kinds of grapes are grown in all the best claret vineyards, that they are gathered separately beginning with the Malbec, then the Merlot, Carbenet, Sauvignon, Carbenet, and Verdot, and fermented in separate vats, and when drawn off a proportion of each is put into each hoghead, and that it often takes a week or more to complete the filling, and that the wine takes no harm from being kept on ullage during the time of filling. Mr. Close kindly gave us a letter to a relative, M. Viellard, who has a vineyard in the Medoc and is still gathering grapes there. He has a large pottery establishment in Bordeaux, and we found him there, and he kindly arranged for us to see the vineyard next day. We afterwards called on Messrs. Junot Freres & Kappelhoff, to whom we had an introduction from our good friend, Mr. John Hopkins, of London. M. Kappelhoff and two nephews received us very kindly, and showed us round their cellars, which are near the wharf, and their offices overlook the broad river Garonne in front of them. Their cellars are nearly all above ground, but are mostly arched over, and are very cool and damp, and the walls, casks, and bottles all covered with greenish mould. Communication from one cellar to another is through sliding iron doors as a precaution against fire. Here are the old wines in cask, and large stacks of the finest wines of the country in bottle, many of them in bins made of iron. One cellar was stacked quite full to the arched roof with Chateaux Margaux of one vintage, in bottle, and there is said to be 300,000 bottles of wine in stock. We had the pleasure of tasting some very fine wines—Chateau Yquem fifteen years old, and Sauternes of 1876 and 1878, both in splendid condition and of a beautiful green golden colour and exquisite bouquet and flavour. Our Sauvignon, grown at Tintara, from the vines brought out by Dr. Kelly, comes nearer to these wines than any I have tasted in Australia, but it wants a certain dryness under the sweet. I believe we shall be able yet to make Sauternes.

In one cellar we noticed two vats, of about 2,500 gallons each. They are used for blending. They reach quite to the ceiling, and are filled through a trapdoor from the floor above. It is drawn off into hogheads by a tap, having two branches, with hose attached, so that two casks are filled at the same time.

We noticed that all the casks of old wine were on their side, but that a tap-hole is bored ready for drawing off without having to move the casks. The new wines are all kept in cellars above ground, and are kept bung upwards, and frequently filled up. They have a tasting office about the centre of the cellars, and rails laid to roll casks on to the dispatching-room near the front, and here the cooping and marking is done before the wines are shipped.

At 12 next day we took train for Macau Station, in the Medoc, and found the carriage of M. Viellard in waiting to take us to Chateau Larrieu Terrefort, about a mile from the station. On our arrival at the chais, or winchouse, we were taken in hand by the foreman—a very intelligent man—and shown through the chais and cellars adjoining. Wine-making is still going on and grapes are coming in in drays, each drawn by two good stout horses. The grapes are brought in in large tubs holding about 5 cwt. each, and two of them is a load. The drays are backed up to the chais, and the tubs hoisted up to the second story by a travelling crane. The tubs are very strong, and fitted with pivots about halfway down, and are easily emptied into lagars or treading-boxes on low iron wheels. These lagars are made of 4-inch deal, and are 12 feet long by 8 wide and 16 inches deep, and well bolted together. There are three of them, and they overlap the tops of the fermenting vats about a foot. There are two rows of these, from 8,000 to 16,000 gallons each, and they come up about four inches above the floor, and on the head is a door about three feet square, with hinges, through which the vat is filled.

The grapes are trod first in the lagar in which they are emptied, then shovelled into a square sieve standing on legs in the next lagar, where three men soon rub them from the stalks. The sieves are of wood, and the meshes a little over an inch square. They are again trod, and then a plug is withdrawn from the side and the juice allowed to flow into the vat below. After another treading the skins are shovelled over the side into the vat, which is usually filled in one day, but not always, and when full enough the door is closed and about an inch of plaster of paris is spread all over the head, rendering it quite air-tight. A bent tube of tin of one and a half inches diameter is inserted in the head and turns over into a small tub of water, which allows the gas to escape and prevents the ingress of air. The head is never pushed down or kept down in any way below the juice, and they say it is not required, and that they get plenty of colour without doing so. The vats are left to ferment from twenty to twenty-five days, and are only used once during the vintage. After the wine is drawn off sugar and cold water is added to make a second wine, and after that the skins are given to the men, who make another browwing from them for their own drinking. The foreman said that in a late season like the present one all the stalk is taken out as we saw them doing, sometimes half is taken out, and in some seasons it is all left in and fermented together. The density of the must to-day was 10° by Costi's saccharometer. It had rained a little in the morning, which would have made it a little weaker. The grapes coming in are the verdot, from the "palus," or low-lying vineyards; they are not at all shrivelled, and not very sweet to the taste. We asked our guide what they did to

preserve the fermenting vats when not in use. He said that they were well washed after the vintage and sponged with alcohol, and left till the next vintage, when they are again sponged with spirit before being used. No sulphur is used. We saw two or three empty ones with the tap-holes open; they smelled rather old, but not acid or mouldy. From here we walked across to the adjoining vineyard of Chateau Dausac, which belongs to Nathaniel Johnston and Co. The chais here is of one story only. The gathering was all completed, and the wines all fermenting in seventeen large vats all plastered down. The gas escaping through the water makes a strange noise. They were busy here getting the new casks ready to receive the wine; first scalding them with boiling water, then rinsing with cold water. After being drained they are rinsed out with strong spirit. No sulphur is used. At the entrance to the chais at Viellard's we noticed a large open cask filled with common red grapes crushed, and having a tap in the lower part. Half a cocoanut shell lay on the grapes. On enquiry we found that it was for the use of the men, and that as they draw off from below more water is added, until it gets too weak. I wonder what our labourers would say to such "tipple" as this. We tasted it, but would need to be very thirsty to drink much of it. We then went round the vineyards and noticed many large heaps of manure ready to be put on to the vines. The soil of all the best vineyards is mostly composed of white quartz gravel, and very little loam among it. The lowlands are a stiff clayey soil, and with the rain in the morning was very sticky and bad to travel over. The vines are all planted at about four feet apart between the rows, and are trained on low trellisses of bamboo, and in some places wire is used. The strong vines are pruned with one long rod, and the weak ones short. On the gravel the vines are very weak and small compared to what we have seen in the South of France, and the stems are covered with moss. They are carefully trained, but not topped. On the flats, or "palus," the vines are much stronger and planted wider apart and trained on higher trellisses. Some part of the vineyard is said to be 150 years old, but it is being constantly renewed by layering to fill up the place of vines that die or become sickly. We came on the vintagers. There were thirty-six gatherers; mostly women and children. To every four or five gatherers is a man to carry the grapes to the drays in an iron bucket strapped on his back. We noticed that they left a few unripe grapes on the vines; but on looking into their buckets we saw plenty of rotten grapes, and shall never more believe the stories about the careful sorting, &c., that one reads of. The women look after the children to see that they work properly, but they do not seem at all lively. Perhaps the damp weather and the sticky soil weighed on their spirits, as it certainly did on ours, and we were pleased on returning to the

chateau to have a cup of tea presented to us, and the only good one we have yet been able to obtain in France. After a visit to the kitchen, where preparations were making to feed the vintagers, we left, well pleased with the attention shown to us by all we came in contact with and the information obtained.

LETTER XXI.

VINEYARDS OF THE MEDOC. — CHATEAU LAFITTE. — CHATEAU MARGEAUX. — ST. PIERRE. — CULTIVATION OF THE VINEYARDS.

OCTOBER 17.

BOOK train this morning to St. Julien Station, on the Medoc Railway. Here we found M. Kapelhoff waiting for us, and we went on with him to the next station, where his carriage was in waiting to take us round to see some of the best of the world-renowned vineyards of the Medoc. We were accompanied by M. Tastet, a wine-broker, and whose father is a large vineyard proprietor. We drove first to Chateau Lafitte. It is a beautiful place, but as we proposed to visit several places we did not stay long here. We tasted several of the 1882 wines, which seemed to us very light both in body and colour. We next called at Chateau Mouton. The chais here is nearly new and of two stories, and in the form of the letter L. There is a row of vats on each side of the lower story, all raised on walls about four feet high, and the tops of them come a little above the second floor. The grapes are lifted from the drays at the angle of the building with a crane and emptied on to the lagers on rails, the same as described in my last letter. Everything here is in first-class style — the vats all varnished, the hoops japanned, and the floors scrupulously clean. The grapes were all gathered and fermenting in the vats, which were plastered down in the usual way. Next called at Chateau Latour and tasted the wines of 1881 and 1882 vintages. They were very good, but rougher and fuller than those of Lafitte.

We then drove to Chateau St. Pierre, the property of M. Kapelhoff. The chais here is of one story, in the old style. We noticed the way the vats are filled here and at Chateau Dausac is by carrying the crushed grapes up an incline on wheels, so that it can be easily moved about from one vat to another as required. We tasted here some very fine wines of vintages 1881 and 1882.

The older wines had all been removed to the cellars of the firm in Bordeaux. We lunched with our kind host and his amiable family, and had the pleasure of drinking some of the finest clarets and Sauternes of the world. I especially remember a Sauterne of 1869, like liquid gold, and Chateau Latour of 1875, and St. Pierre of the same year; also Chateau Margeaux, which we liked the best. After lunch we drove to Chateau Margeaux, through vineyards all the way. Here we tasted the wines of 1881 and 1882, and found that of 1881 the best new wine we had seen. The chais and cellars here are magnificent, and the latter for the new wines is 200 feet long and very lofty, and the roof supported by a row of massive pillars in the centre. There is room on each side for six rows of casks, which are all placed ready to receive the new wine as soon as it is ready to draw off from the vats.

The cellars here, where the old wines are kept, are at some distance away, and entered through the cooperage, and there are no less than three doors to get to them. Here we tasted several of the old wines, but having gone through so much tasting in so short a time the mind got mixed about the several vintages. We noticed here that the vines were trellised on two wires about three feet high, and most carefully pruned and tied to the wires. Lastly we called at Chateau Margeaux Palmer, and found them here getting ready the hogsheds for the new wines in the same way as described before. They never sulphur a cask until the first racking, as they say it interferes with the fermentation. We noticed that the hungs in the one-year-old wine were not driven, and could easily be removed by the hand. The tapholes are all closed with neat plugs wrapped the long way with clean rush, and the casks are kept filled up. The broker, M. Tastet, carried his own silver valinche and saucer, and took the samples himself from the casks, the cellar-man removing the bung for him. The wine is everywhere carried from the vats to the casks in buckets holding about ten gallons with a pole through the centre and the top hoop forming a lip, and they are carried by two men. Where the chais is of one story the crushed grapes are carried in wood or iron buckets strapped on the shoulders of the men. The many villages we passed through have all an air of neatness and prosperity about them, and there are no old or tumble-down houses to be seen, and every appearance of the people doing well. Generally the vines are planted about four and a half feet apart, and trained to low trellises—they say to get the heat of the ground, which is everywhere gravelly. Near Chateau Margeaux we saw a place where they had excavated. It was almost pure white quartz for nine feet in depth. M. Tastet said that many of the Australian wines had the taste of the Eucalyptus with them, and M. Kapelhoff and he agreed that the wine made

from French vines grafted on stocks of American vines had the foxy flavour, and that wines grown near pine-trees could always be distinguished by the flavour of the pine in them. These men, who are daily tasting wines from their childhood upwards, are ready to find the most trifling differences in flavour, such as would not be noticed by ordinary mortals. We returned to Margeaux Station in time to catch the evening train, and parted with our kind host, who had enabled us in one day to visit the most renowned vineyards in Europe.

OCTOBER 18.—We called on A. de Luz & Co., to whom we had sent some samples of wine a few years before. They informed us that a son of Mr. Hubert de Castella, of Victoria, was at Latour for the vintage, and we were sorry we did not see him. After looking at some cellar tools, &c., we required we took a run to Langon by rail in the afternoon, and took a walk into the country. We went into a small vineyard where a man was ploughing his vines with one cow. He took pains to show us the different kinds of vines. The kinds grown here are the Sauvignon and the Semillon, both for white wines. They are trained to long poles like hops, and the Semillon is pruned to short spurs, but the Sauvignon is pruned with one long rod, which is bent round like a bow and tied to the vinestock. We called at a wineshop in the village, the sign being a bush hanging over the door, and were served with two glasses of red wine, very thin and new, but quite strong enough, and were charged 6 sous, or 3d., for it. The vines about here are being ploughed with a plough which has the beam prolonged to the yoke of the cattle drawing it, and having a very long turn-furrow. They turn the earth up to the vines at this ploughing. The soil here is a friable sandy loam, and is easily cultivated. We saw about here many plantations of acacia, grown for stakes. This is considered the best wood for the purpose.

The cultivation throughout the Medoc is very thorough, and M. Kapelhoff said that it cost 1,500 francs per hectare, or nearly £20 per acre. I think I must have misunderstood him.

The phylloxera is kept in check in the best vineyards by the use of sulpho-carbon of potassium, at a cost of from £5 to £8 per acre. The lowlands are inundated whenever it can be done, and new vineyards are being planted in such situations.

The charges at hotels here are very high. At the Hotel Nantes, where we stopped, they charged 6 francs for dinner, and we got better served at Oporto at less than one-half, and got better wines there at a shilling per bottle than here at 3 francs. On the 19th I started for England via Paris to fetch Mrs. Hardy, and left my son Robert at Bordeaux. About Libourne saw signs of the phylloxera and men at work pulling the vines up with windlass and chains. There are vines more or less all the way

to Orleans, and the journey was a very interesting one. I noticed the varied crops grown and small patches of ground under cultivation, and the number of women at work cutting clover and lucerne for stall-fed cattle. Very few cattle are to be seen on the land anywhere in France.

Ploughing is nearly all done with light ploughs drawn by one horse. I saw one team of a horse and a small ass alongside of him, and only saw one two-horse team at plough all the day. I got to Paris in the evening, and made for the Hotel d'Angleterre, a small but very comfortable house near the Champs Elysee, and next day on to England.

LETTER XXII.

CHATEAU YQUEM.—SAUTERNE VINEYARDS AND THE VINTAGE.—
SWEET SAUTERNES.

DURING my absence from France my son Robert, whom I left at Bordeaux, visited several vineyards, and was careful to take notes of all he saw, and I extract the following from his diary:—"October 23.—Took train at 1.40 from Laugon, where M. Dupouy, a winebroker, to whom we were introduced by A. de Luz & Co., was waiting for me. We took a carriage and drove to Chateau Yquem, through Fargues. The country is undulating and very pretty, with plenty of pine and acacia trees. Chateau Yquem and all the first Crus are on gravelly and sandy land, with argillaceous subsoil. The vines are planted at a distance of one and a half metres apart. Some have a stake to each vine, others are trained on wires. The kinds grown here are principally the Sauvignon Blanc and the Semillon. The latter has large berries, round, and a loose bunch; the wood is much darker in colour than the Sauvignon, with short joints. They are both pruned to two or three spurs, and not more than two or three buds to each spur. This is done to keep the crop near the stock to make the grapes ripen sooner. The grapes are allowed to get to a state between a raisin and a rotten grape, and they have to go over the vines from four to eight times to get them in the proper state; they are gathered with small sicateurs and the fingers. The Chais at Chateau Yquem is a large one-story building on one side of the yard, and the cellars are on the other. There are eleven large presses, each one in a lagar, with a window opposite to it, through which the grapes are emptied.

The presses are much the same as in the Medoc; the grapes are trod and pressed, and the chese pared down and piled up three or four times. The juice is put into hogsheds, which are filled up so that you can touch the juice with the finger. During the first fermentation the yeast runs over the side. They say that in a good year, when the grapes are in a good condition, they let the yeast go to the bottom, as it nourishes the wine, but in a bad year it must be taken off as much as possible. After the fourteenth day the casks are filled up and kept filled up every eight days. They are closed only with a bottle, turned upside down, in the bung-hole. After from six weeks to three months the wine is racked, but is not then clear, and it takes from six to twelve months to clear. It is only in bad years that the wines clear quickly. I spoke to them about Mr. Hubert de Castella's idea of not filling up the casks. They said the wine would become bright sooner, but it would spoil the flavour and would have a taste given by the ullage. They are very careful here to wash the bung-rags very often, and not to have any bad smells about the place. The vineyard is 110 hectares, and produces 6 hogsheds of 48 gallons each to the hectare. It is situated on a nice hill, and you can see from it nearly to Bordeaux, and have a view of Chateaux Latour Blanch, Guiraud, Lafont, Haut-Peyrague, and several others. Chateau Yquem is owned by the Marquis of Saluces, whose residence is at Chateau Fillet, through which we passed; he also owns Chateau Coulet in the Basac, which we also visited. We tasted some of the new wine here; it had fermented quite dry and had a nice bouquet already. We also tasted a wine of 1868 vintage; it had a splendid perfume and was sweet, but not too sweet. They do nothing to keep the wine sweet, and it is only in a good warm year that it is sweet. M. Dupouy said that some of the vigorous at Berigac, in the Graves, stopped the fermentation with sulphur, and that the wine is sent to Paris to be drunk at once by the workpeople at two sous the glass. On the road back passed Chateau Clemens and Chateau Doisy, and took the train at Cerons for Bordeaux. I noticed that the cellars have very few windows and are kept pretty dark, and the casks all placed in rows, and a portion of the wine is put into each cask as it comes from the presses so as to equalize it as much as possible. The skins after being pressed are given to the workpeople to make piquette.

"October 26.—Went down to Pauliac by steamer, and walked to Chateau Latour to find Francois de Castella, son of Castella, St. Hubert's, Victoria, but he had gone to Blaye, so I walked on to Beaucellou, where they were drawing-off wine. They have a plant here for equalizing it in drawing-off. They connect all the vats with hose to an oval cask holding 220 gallons, and from that it is carried and put into the hogsheds. They were

tying up the vines here preparatory to ploughing the first time, and I saw several men hacking off the branches from a piece of vines which was forty-four years old, and was to be rooted up this winter. Called at St. Pierre and paid my respects to Madame Kupehoff and family, and back to Latour and found Castella, and stopped the night with him at Chateau Verrier, where he was lodging. He is a jolly fellow, about 16, and I was glad to meet him. I went with him next morning to Latour to see the 'ecoulage' or drawing off of a vat of red wine. It was dry and rough, but had a nice bouquet; but it was not bright, although it had been twenty days in the vat. The presshouse here contains twelve vats and two stone lagars, with presses for them; there is also another press on wheels. The presshouse and cellars form a square, with a large courtyard in the centre. The cellars are kept very dark, and the casks have all glass bungs in them. On the 22nd I called again at Chateau Terrefort and Chateau Dauzac and saw them drawing off at both places. The wines were not clear, but the foreman at Terrefort said it would clear in a month."

LETTER XXIII.

BARBEZIEUX.—M. BOUTILLEAU AND SON'S BRANDY DISTILLERY.—RAVAGES OF THE PHYLLOXERA.—KIND OF STILLS USED.—VINEYARDS TURNED TO DAIRY FARM.—BRIE CHEESE.—COGNAC.—OTARD, DUPUY, AND CO.'S.—MARTELL'S CELLARS.—DISTILLERY OF M. MOULEN.

NOVEMBER 2.

LETTER London with Mrs. Hardy, and next day met my son Robert at Angoulême, and went on to Barbezieux, in the Cognac country, the same evening. Next day called at the office of Messrs. Boutilleau, to whom we had an introduction from my friend M. Frere, manager for Mr. J. T. Fallon, at Albury. It being Sunday there was no business doing, and M. Boutilleau and Sons kindly offered to drive us out to their farm and distillery, about two miles from the town. This was about the centre of the best brandy district in France, and was nearly all in vines before the phylloxera destroyed them; now only a few sickly-looking stragglers are left. The country is slightly undulating, and the soil a sticky black clay, almost like our Bay of Biscay land, and all on a shaly limestone formation; in many places it

works up with the top soil. I am sure there is plenty of similar land in Australia to be found. We noticed a few vines left under a large chestnut-tree, and Mr. B. said the tree had preserved them from the phylloxera. The distillery was at work. There are four stills, ranging from 400 to 700 litres each in capacity; three of them are the common still and worm and heated from below with coal; the fourth had a copper vessel placed above the still, which is filled with wine to be distilled; the vapour passes through this heating it ready for the next charge, but it is not considered much of an improvement and not very generally adopted. I noticed that the spirit was running off quite warm from one still; the others were nearly spent. One man was attending to all four of the stills, and M. Boutilleau, jun., who was with us, said that they usually run off at 70° and reduce the spirit afterwards with distilled water to 60° of Celsius; also that they had tried all sorts of so-called improved stills in this part of the country, but that they had not been found to answer as they took too much flavour out of the brandy, and they all had to go back to the old plan of still. If they wish to make a very *fine* brandy they put by about ten litres of the first run, and take care not to run it too low at the finish. He said he had received a sample of brandy from M. Frere, of Albury, but found it too *dry* and wanting flavour, but not otherwise a bad article, and was quite of opinion that we ought to be able to make good brandy in Australia. They do not ship their finest brandies to Australia, as they cannot get their price for them there. The wine they were distilling was a white wine of the last vintage, grown about twenty miles from here. It was a full-flavoured rough wine, not a thin watery wine, although of very low strength; it was not clear, and the casks containing it are rolled about without any care to keep the lees from mixing up with it. M. Boutilleau said it did no harm to distil the lees with the wine, and some were of opinion that it improved the flavour. It costs from 70 to 75 francs the hectolitre now, or about 1s. 3d. per gallon, and before the phylloxera it was about one-half that price; he also said that the wine is ready to distil as soon as the fermentation is over, and that no more is given for old than for new wine. The principal grape grown is the Folle Blanche, or Gouais, and it yields from 15 to 40 hogsheads of 48 gallons each to the hectare, its principal recommendation being that it is a heavy bearer. Almost any other white grape would give good brandy from this land, and it depends on the soil to give the different qualities and flavours more than on the kind of grape grown. The black grapes are considered to give a coarse brandy, and are not much grown. When the phylloxera set in M. Boutilleau had all his vines rooted up, and grew clover and started a dairy of fifty cows, which are all kept tied up and fed in a long shed well paved, and

the cows well littered down. The milk is all made into the "Brie" cheese, a small cheese about an inch thick, and, like cream cheese, is not pressed, but drained on straw mats, and when a little mouldy on the outside is fit for sale and commands a high price. The dairy and cheese-room are at one end of the cowshed, and kept very clean; the smell from the cows is considered to be good for the cheese. M. Boutilleau is evidently an advanced agriculturist, and has chaff and pulping machines driven by steam, and is building a new dairy. The pigstyes are well paved, and the greatest care is taken of the manure, both solid and liquid; there is also a fine hayshed, where the clover-hay is stowed away. After tasting some brandy thirty years old we returned, after a most pleasant time with our kind friends, one of whom spoke good English, and had a look through their well-kept town cellars, where they have a large stock of brandy, some of their vats holding 30,000 gallons; but a good deal of the stock is kept in hogsheads, as it improves much faster in them, but the loss from evaporation is fully 5 per cent. per annum.

NOVEMBER 5.—Got to Cognac this morning and put up at Simon's Hotel. The country all the way is very similar in character, but near Cognac the soil is redder in colour, but the same limestone subsoil is there. There are scarcely any vines to be seen, and no new plantations making anywhere. After breakfast we visited Messrs. Otard, Dupuy, & Co.'s establishment, and were kindly shown over it by M. Otard himself, who let us taste a brandy fifty years old, the flavour of which I shall not soon forget. We also saw the new brandies just brought in from the farmers, and he showed us a lot of fifty puncheons which he had just bought at 8s. per gallon; it was quite white and very clean and good flavoured. M. Otard was very hard on what he called the *new firms*, who, he says, use up large quantities of German spirit, which they distil over again with wine, and undersell the old firms. We saw plenty of German spirit casks at the railway station.

NOVEMBER 6.—Our obliging landlord, M. Simon, took us to see Martell's large establishment, which occupies a large portion of the town, covering many acres of ground. The buildings are mostly one story and detached from each other, with plenty of space between, and we were told it was done as a precaution against fire. In one room we saw forty vats of about 3,000 gallons each, all fitted with agitators worked by steam. The brandies are blended in them and then run into vats on a lower level, and from these filled into casks for export or pumped away through copper pipes to the bottling cellars. There are several double-action brass pumps, all worked by steam. There is a distillery with four large stills, and each still has two heads and separate coolers, and is heated from below. They are only used

for distilling water, and no brandy is distilled in the place. A hydraulic lift takes the casks of brandy as they come in to the top floor, and from there they are rolled on to long troughs and run down into the blending vats below. On one of the top floors we saw a number of hogsheads of brandy with the grower's name and the age marked in chalk on the heads; some of it was thirteen years old. We showed one of the foremen a sample of brandy we brought from California. He said the smell was not good, but that it arose from the soil and not from careless distillation, and that it was too dry and wanting flavour. The whole of the establishment is kept in splendid order, and it is a pleasure to see how smoothly all the different operations of bottling, packing, &c., go on in such a well-regulated business. They told us that owing to the destruction of the vines they were not going to sell any more brandy in bulk after this year, and that in future it would all be bottled.

In the afternoon M. Simon took us to the farm and distillery of M. Moulen, a brandy merchant of Cognac; it is two or three miles out, and on a reddish soil, with limestone subsoil. There is a vineyard here which has been preserved by the use of chemicals, and which has given this year 300 casks of wine. The vines are nearly all the *Folle Blanches*, and are spur-pruned and grown about five feet apart without supports, and not topped during the growing season. There was one still at work here of a capacity of 600 litres, and heated with a coal fire, but the distiller said that wood was the best fuel. There was a heater attached to the still having a coil of six rounds inside. It holds a full charge for the still. The wine they were distilling was thin and hard but not acid, although covered with "flowers." The distiller said it took ten hogsheads to make one of brandy. The still is kept going day and night, and the distiller has his bed alongside. He said he got through five or six charges in twenty-four hours, but of course he has some help during the night. He told us that he kept back a portion of the "foreshot," or first run, and returned that and the "faints" into the wine to be distilled. The chais alongside the distillery was fitted with a large wooden lagar, where the grapes are trod, and three single-screw presses are fixed on three sides of it. The grapes are pressed in round cages of wood, strongly hooped, and are 3 feet deep and from 5 feet to 6 feet across. The juice runs into a tank, and is pumped away into vats. The last charge was still in one of the presses, and smelled very sour. We saw some red wine covered with flowers, and which is drunk by the labourers. Ours in Australia would not look at such poor stuff. A windmill is used to raise water into large tanks above ground, and conducted in iron tubes to the vineyard and used to wash in the sulpho-carbon among the vines.

The cowsheds here are well kept, and the cattle all tied up and fed with clover and roots.

It is fortunate for this district that the land is good, and although the more profitable cultivation of the vine is at an end, the land can be turned to other uses.

I feel very confident that we shall be able to make good brandy in Australia, and that it will be a profitable business, but will require much capital to work it properly to give the age necessary to turn out a good and wholesome article.

LETTER XXIV.

BORDEAUX.—JAMES VIOLET AND CO.'S ESTABLISHMENT.—PACKING OF PLUMS.—CETTE.—M. VACHER'S CELLARS.—NEURSULT, IN THE BURGUNDY COUNTRY.

NOVEMBER 6.

GOT to Bordeaux in the evening, and put up at the Hotel de Americaines, which we found very comfortable and the attendance good, and the charges about one-half of what we paid at the Hotel de Nantes. We remained here until the 11th, during which time we visited several of the leading wine merchants. We also drove out to Leognan, about nine miles from Bordeaux, to see M. Emilie Dubois, who represented South Australia at the Bordeaux Exhibition, and received from him the medals and diplomas awarded to the exhibitors. We obtained from him much information about the management of the wines of the country. He said that the Judges were surprised at the quality of the brandy from Adelaide, and could hardly believe it was Australian.

We also called on James Violet & Co., the large packers of plums. They are also wine merchants. We were shown over the premises by Mr. J. Violet, jun. It is of two stories, and the upper floor is wholly devoted to the plum trade, whilst the wine cellars are below. The crop of plums was coming in in barrels holding about 3 cwt. each, and women were busy at tables sorting them according to size, from 40 to 80 to the pound. They are then taken to the packing-tables, where women pack them very carefully into the glass jars in which we get them. After they are filled the jars are passed into a room, which is heated, and which we were not allowed to enter. When they come out of this room they have acquired the the glossy black appearance.

From here they go into the labelling and packing room downstairs by a hydraulic lift. The plums are grown near Agen, and are dried partly in the sun and finished in ovens. The firm is an old one, and was founded by a prisoner of war in the time of the First Napoleon.

On the 10th we took rail to Margaux Station to visit M. Lebeque, to whom we had an introduction from Mr. P. B. Burgoyne. He had gone to Bordeaux, but his father-in-law was at the vineyard of St. Vincent, situated on the "palus," or low lands, near the River Garonne, and we drove there and found him busy getting the last vat of wine drawn off and pressing the skins. The cellar, or warehouse, here is of two stories, on a similar plan to others I have described. Two powerful screw presses were being used; they are fixed on wooden lagers on wheels. They were filling them with the skins brought up from another detached cellar in buckets of iron strapped on men's backs. After being pressed they are thrown into vats below, and water heated to 23° and good white sugar, at the rate of 14d. per lb. to the gallon of water, put to them and fermented over again; and this is the way that most of the cheap clarets are made. We noticed that the greater portion of the stalk was left in, and were told that it is required in these wines to help to keep them. The vines here grow much stronger than on the higher land and are trained on wire trellises, and produce an inferior wine in large quantities. After seeing pretty well all of any interest to us in Bordeaux, which is a busy place, we started on the 11th for Certe again. At Agen we saw a good many plum-trees, but no large plantations of them as we expected from the large quantities which must be grown hereabouts.

NOVEMBER 12.—Called on M. Schuydt de Vachter, on the Quay Chartrons, to whom we had an introduction from his cousin, of the firm of Eschaneur & Co., of Bordeaux. He deals in all sorts of imitation wines, and was kind enough to show us over his large establishment and let us taste the various wines. First the thin red wines made in the neighbourhood of Certe; they are poor and flat after the Medoc wines. He said they were worth about 37 francs the hectolitre, or 1s. 5d. per gallon, at a year old. We also sampled several older and better wines of Roussillon and Narbonne; we also noticed a lot of new white wines of the district stacked in an open yard two tiers high; they were still milky and fermenting, and would remain here until they are clear before they are racked. They were very dry and thin, and not not near so good as our Bordeaux grown at the foot of our Adelaide hills. We also saw some sweet white wines in which the fermentation had been stopped by adding 90 litres of spirit to the butt, or nearly one of spirit to four of wine. We were next shown a Greek wine nearly as black as ink and fearfully

astriquent, but was considered a very useful wine in making up imitation ports. We also saw many Spanish wines, some dry and full-bodied, others sweet like those we saw at Tarragona, and all useful in a trade like this. We then went into a large yard enclosed with high walls full of wine in butts three tiers high, white ports for Russia, sherry and port for America, Madeira, and Malaga, and all exposed to the sun and rain. We tasted the ports; they are a fair imitation, but not so good as our Angaston wines. A sweet Malaga was very good, as was a sweet Muscat, but it had not the true Frontignac flavour. We noticed that none of the wines were very tightly bunged up, and M. Vaechter removed the bungs easily with the hand as we went along. Many of the red wines had the white seum, or "flowers," on them, and none are kept well filled up. The thin red wines of the country are kept in large vats of 7,000 to 8,000 gallons, and are said to do better than in smaller casks.

We showed some of our Australian wines to M. Vaechter and his son, who took great interest in them, and thought that our red wines would all make port and the white sherry, and said they were better made than the Spanish wines generally are. We also showed them to M. Espitalier, the British Consul, who is also a winebroker. He thought them well made, but more suitable for the English market than for here. He considered that our red wines were all very "yellow" for their age, and said that would be an objection to them here.

I had a desire to leave my son here for a year or two; but after spending a few more days on this our second visit here I came to the conclusion that he would learn more by experience in our vineyards and cellars than he could here. We left Cette on the 13th for Marseilles, staying a few hours at Montpellier, and arrived at Marseilles the same evening. Our intention was to have gone to Italy; but, having taken a severe cold at Bordeaux, which prostrated me completely, we decided, after staying a day at Marseilles, to make tracks for Paris, staying a night at Macon, and on next day to Meursault, in the Burgundy country. We had an introduction from Mr. Grainger of London, to M. Tétard, manager of a large wine cellar, who received us very kindly and showed us through the cellars, which are all below ground and very wet, and the walls and roof covered with black mould; but we found here some magnificent wines, especially the White Burgundy, or Chablis, which we consider the finest dry white wine we have seen. The grapes are crushed in an upper story over the fermenting-room with one of the Bordeaux made mills and separator. We noticed that the rollers are of cast-iron, and covered with knobs to draw in the grapes. It is said to answer well where the bunches are small and the grapes not over ripe. The fermentation of the red wines is carried on in oval

vats of about 800 gallons capacity. They are not very deep, and have no top head, or any means of keeping down the head that we could see. M. Tétard said that the fermentation was continued for fourteen or fifteen days, and that men get into the vats naked and tread down the head, and that the heat of their bodies promoted the fermentation, but did not say how often it is done. We walked a little way into the vineyards. The vines are planted very close, only about two feet apart, and very irregular. They are pruned to one shoot with only two eyes, and the old wood in most of them was from two to three feet long. We asked why they did not cut them back, but he said they would all be laid this season below the ground, and the vineyard in this way renewed. The vines here are generally staked, and the stakes are taken up after the vintage and stacked in piles until again required. We saw one vineyard planted in rows five feet apart and trellised with wire and the land ploughed. The soil is a reddish loam very full of stones, and very similar in appearance to the Auldna Vineyards, near Adelaide. We were afterwards shown over the Chateau, which is a fine well-stated residence, and splendidly furnished. We afterwards visited a mustard mill in the village, worked by both steam and water power. The mustard is all ground with vinegar, and put up in stone jars for sale.

We were sorry to have to leave this part of the country without seeing more of it, but were anxious to get to Paris to rest and recruit before visiting the champagne vineyards and cellars at Epemay.

LETTER XXV.

VISIT TO THE CHAMPAGNE COUNTRY.—VERTUS.—PRIEUR AND CO.'S CELLARS.—SMALL PROPRIETORS' VINEYARDS, YIELD OF.—MOET AND CHANDON'S CELLARS.—MERCIER AND CO.'S ESTABLISHMENT.

WE spent a week in Paris, and during that time saw as much of that truly wonderful city as was possible. Among other places visited by us was the Halle des Vins, near the Paris and Lyons Railway Station. We were taken there by M. Charles Prieur and his son, to whom we had an introduction from Mr. Wicksteed, of Port Adelaide.

This immense wine market covers many acres of ground, and is full of cellars and offices of wine merchants, and thousands of

pipes and butts of wines stacked in the open ground, but we saw nothing to note of any interest in cellar arrangements. M. Prieur informed us that the daily consumption of wine in Paris is 880,000 gallons. We lunched daily at one or other of Duval's restaurants, and got a very fair Magon wine at a shilling the quart bottle—the best value for the money of any since leaving Oporto, and always of the same quality.

Wines are charged very high at hotels generally, and at Bordeaux we paid three francs for an inferior claret, and the same for a very medium Chablis in pint bottles.

NOVEMBER 24.—Left Paris for Epernay, but went on a few miles further to Vertus, to visit the cellars of Charles Prieur and Co. there. We were met at the station by M. Siniger, the manager, who took us just outside the town to have a look at the vineyards; but it came on to rain, and we could not see much of them. We then visited the champagne cellars, which we found very complete and well arranged. In a large open shed in an enclosed yard we found two very large and strong single screw presses. The screws are set in a cemented bed, nearly level with the floor, and ten feet in diameter, with gutter round, leading to a cemented cistern sunk below the level. The grapes are brought to the press in deep baskets holding about 1½ cwt., and emptied without crushing into a large shallow round cago and then pressed.

After sufficient pressure the refuse is fermented with water to make a common red wine for use in the district.

The cellars are over 200 feet long and 40 feet wide, and are two stories above ground and two below. The ground-floor is full of the new wine, all in hogsheads, and is all bunged down, but not tightly yet. Those we examined are still milky in appearance, but the first made are beginning to clear. They have a different taste from any of the new wines we have seen in other places, being sharp and lively on the tongue. The grape mostly grown is the Pincau Noir, and the gravity by Beaune this year was 11½. In some years it rises to 12°, and that is considered too strong.

The next cellar below is filled with wines from one to six years old, all in butts. We tasted some of the oldest. It is quite fit to be bottled, but has first to be vatted with a portion of newer wine. The lower cellar, which is 15 metres below the surface, is divided by a row of arches into two bays of 20 feet wide, and here are solid stacks of champagne in bottle. Some of it is said to be six years bottled, and before it is fit to send out has to go through the process of disgorging, which takes from three to four months to effect, and a large quantity is always going through the process. We tasted some of vintage 1870 not yet put through. It was a fine dry wine; also one of 1875, which we liked even

better. We were shown the disgorging, syringing, and tying down with wire and string. The firm was established in 1840, and their name stands well in Australia. After dining with the manager and his family we returned late in the evening to Epernay, and next day (Sunday) before breakfast had the pleasure of seeing M. Foreur, whose son is now foreman in Messrs. Bickford's aerated water factory in Adelaide, and was in my employ on his first arrival in Australia.

The old gentleman, who is a good specimen of the peasant proprietors of this country, came in from the village of Haut-villiers, four or five miles, to see us, and after breakfast, together with his son-in-law, we visited some of the vineyards near the town, and spent most of the day, which happened to be fine and clear, in admiring the palatial chateaus of the wealthy wine merchants in the town and suburbs.

M. Foreur was able to give us much interesting information. The vines were all very closely planted; many of them are not more than a foot from each other. They are laid down every second year, and pruned to one or two spurs, and very few of the stocks are larger than one's thumb. They are all staked, and carefully tied and topped after the blossoming is over, and the ground worked by hand labour. Land intended for vines is hand-trenched to the depth of half a metre and the large stones picked out. A vineyard lasts about fifty years. They use all sorts of manure, but that from horses and cows is preferred. M. Foreur has a small vineyard of two acres, and has already sold and delivered his wine. He had 32 hectolitres, and received 308 francs per hectolitre, and must therefore have got nearly £400 for it. No wonder this country looks prosperous and no tumble-down houses to be seen; and yet there is poverty even here, for I saw from my window early in the morning a man picking over heaps of dirt put out for the scavenger, and eating something he got out of it. Wages are high here. M. Foreur said 50 francs per week and board and two bottles of wine a day, and M. Siniger said 7 francs is the ordinary rate per day for labour.

NOVEMBER 26.—M. Foreur and his wife called early for us. They had walked in from their home, and are a fine healthy-looking old couple, and were both delighted to see us and hear of their relatives. They took us first to the cellars of Moët and Chandon, who always buy their wine. We were first shown into the cellars on the ground-floor, and here all the processes of disgorging, syringing, tying down, labelling, and packing is going on in regular order, and from these to the first cellar below, where there are large stocks of wine in casks, not many of them over 200 gallons. The 1880 and younger wines have all a small hole bored near the bung and three straws stuck into it to allow the gas to escape and yet prevent the ingress of air; here also are

large stacks of thousands of bottles getting ready for disgorging. We then descended to the lower cellars, at a great depth, and in them are immense stocks of champagne in bottles all covered with mould. It is taken from here on trucks in three-dozen baskets, and sent up by lifts to the ground-floor. In one of the cellars on the ground-floor are two immense vats, which are used for blending, and the wine is sent up in hogsheads to the top of them by a lift worked by steam. After breakfast, which is generally from 10 to 11, we visited the cellars of Mercier & Co. They run from the railway in front back into a steep hill. A siding from the railway runs into the outer cellar, and a broad flight of steps from it leads to the offices, which are situated high up on the hill, and from them a fine view is got of the River Marne and the vine-covered hills across the valley and the numerous villages among them. The cellars are all, with the exception of the outer one, excavated out of the solid limestone rock. There are fifty of them running back into the hill, and four transverse ones. Altogether there are said to be fourteen kilometres of them (about nine miles), and they are still excavating more. The cellars at the far end are over 40 feet below the surface, and are of a uniform width of 15 feet, and about 18 feet high to the top of the arch. They are very damp and sloppy under foot in many places; the stone is soft and easily excavated, but is apparently too soft for building or roadmaking. The ends of some of the transverse cellars are fine pieces of sculpture in the stone the full size of the end, and representing subjects connected with the wine and vines. In the outer cellar are two large vats for blending, fitted with agitators; also a splendid cask of 33,000 gallons. The staves are eight inches thick, and it is supported on four walls of solid masonry. The head is beautifully carved in bold relief. There is also in one of the inner cellars a cask of 22,000 gallons, which was at the Paris Exhibition of 1878; that is also beautifully carved, as are several smaller ones. The bottling, labelling, and packing is done in cellars next to the outer one, and the capsuling is all done by women in different styles to suit the trade of the different countries; it is all done very neat, but very slow, and very different to the way the same work is done in America.

M. Foreur says that the wine is racked from three to four times the first year, and that in vating a portion of new wine is used to give the effervescence. The top of the hills is not planted with vines, the soil being too thin. He showed us a large piece at the back of Mercier's, which he said was too poor and not having a sufficient depth of soil over the limestone rock below. Also that a little sulphur is used in racking the wines, more to help to clear it than to arrest the fermentation; also that spirit is often used to strengthen weak wines to the extent of four litres

to the barrique of forty-four gallons. Some more brandy is made in portable stills, and is mostly used in the country. Brandy from the south is preferred for fortifying champagne. There is a beetroot sugar factory near Mercier's, but we had not time to visit it; but we could see immense stacks of beetroot ready for use. Altogether we passed a very pleasant day, and hope the time will soon come when Australia will produce fine champagne, but do not think the right soil or situation is yet found for it.

LETTER XXVI.

DARMSTADT.—MAYENOE.—HENKEL AND CO.'S CELLARS.—COBLENZ.—DEINHARD AND CO.'S.—MANUFACTURE OF SPARKLING WINES.—CONCLUSION.

NOVEMBER 27.

NEFT Epernay by the night train and got to Strasbourg early next morning. The railway station here is very strongly fortified. Spent the morning in visiting the fine old cathedral and other objects of interest; in the afternoon we crossed the Rhine and passed through the fertile and highly-cultivated plain to Darmstadt, where we arrived in the evening. The hills are in many places planted with vines, but always in small patches, and the land generally divided into small allotments the same as in France.

November 28.—Called on Mr. Weber, whose brother is manager of the Iceworks at Thebarton. We dined with him, and had some fine Rhine salmon and several German dishes new to us, and some very good champagne made at Wurzburg. A brother-in-law of Mr. Weber was with us. He has a vineyard lower down the river, below Mainz. He gave us some information about the manufacture of wine in this part. He said that they ferment the red wine with all the stalks for fifteen days, and put down the head twice a day and cover the vats with a cloth, and lay the head of the vat on the top; also that the pressings are always mixed with the juice drawn off. The white wines are fermented for four or five days with the skin and stalk, to give the flavour of the grape which lies in the skin, the juice is then drawn off and put into casks, but not allowed to work over, and kept filled up until the usual time for racking off. We went out a short distance to see a small vineyard. The vines are planted

about $2\frac{1}{2}$ to 3 feet apart, and are pruned to two bearing spurs with three or four eyes to each, another shoot is allowed to grow from below about the level of the ground, one of the bearing spurs is cut away every year and the vine kept low and the growth tied up to a stake and topped.

It is interesting to us to review the different modes of pruning we have seen in the countries we have visited. The long rod propped off the ground at Collares, in Portugal; the single bearing rod tied to the vinestock at Xeres, in Spain; the spur-pruning in the south of Spain and France; the careful training in the Medoc to laths and wire; the system of layering the vines at Meursault and in the Champagne country—each no doubt has been found by long experience best suited to the different conditions of soil and climate.

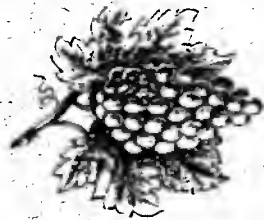
November 29.—Came on early to Mayence, and called on Henkel & Co., to whom we had an introduction. They manufacture here sparkling wines, both white and red. They purchase the must of the white wines as soon as pressed, and ferment it here in casks of about 200 gallons. A good many of them were still fermenting, and had the water-cups fixed in the bungholes to prevent the air from entering and to allow the gas to escape. When the fermentation is over the casks are filled up and remain until the wine is clear in March, when it is racked from the lees. The after treatment is said to be precisely the same as in the Champagne districts of France. The casks are very stout and made of Hungarian oak. The manager showed us several of the wines from the casks. A Hock of 1878 made from the Reising grape, which is the favourite kind grown, was very fine and soft; also a red Asmanhauser, a very fine and light wine; he also showed us various white wines from 12s. to 24s. per dozen case, all in fine condition. He said we shall be able in time to get over the difficulty of our white wines depositing in the bottle, but that it must be begun by careful cultivation in the vineyard. We also sampled some very good sparkling red wines at about 30s., and a fine sparkling Hock at 44s., quite equal to many of the best Champagnes. After visiting the fine old Cathedral we took train again for Coblenz, following the Rhine all the way. The hills here close in on the river, and on the one side are planted with vines terraced above terrace to a great height, much the same as we saw on the Douro. The vines are very closely planted and all staked, but the stakes are still in the ground and not taken up and stacked as we saw them in the Burgundy country. The vineyards are kept very clear of weeds.

November 30.—After breakfast at the Anchor, where we stopped, we visited the cellars of Deinhard & Co., the largest wine firm on the Rhine. One of the partners, Mr. Charles Wegler, very kindly showed us round their extensive and well-

kept cellars, which extend from one street to another. The cellars are of two stories below the ground—the lower one is 45 feet below the surface, and is liable to be filled with water from the soakage from the Rhine when a high flood occurs. It happened last year, and for a fortnight they could not go into the lower cellar, and when they did it had to be in a boat; the water all soaks away again when the flood subsides. They take the precaution to keep the casks all well bunged, and have props ready to prop each cask from the roof to prevent their rising. These lower cellars are splendidly built, and like the crypts of an old cathedral. The wines are mostly in casks of about 250, and a few 1,000 gallons each. A few casks of new wine in the upper cellars was still fermenting, with the usual water-cups still in them. They do not usually get in the new wine from the growers until the second racking in February or March. They are racked here the first time in January and again about six weeks later. The white wines are usually made from the Reising grape and pressed off from the skins as early as possible. They are fit to bottle for sparkling wines in June or July following, and remain in the bottle two years, when it is treated the same as Champagne. There is always a certain portion of the juice of the Pincau Noir mixed with the Reising, it is said to help the wine to clear in the bottle, a certain proportion of syrup is also put into each bottle to ensure the effervescence. The bottles are all sent up a lift to the ground floor to be disgorged, and we saw the process going on. It takes five or six men to keep it going—the disgorging passes each bottle to the one who puts in the syrup, he hands it on to the corker, and from him to the tyer who fixes the cork with string and wire, it is then carried away to others who capsule, label, and pack it in cases ready for export. They do a large trade in the still wines, and he showed us some which had been two years in bottle without the slightest deposit. He said it is difficult to know when to bottle many of the white wines, and showed us one ten years old which had moved every year in the spring and was even not yet fit to bottle. If the wines are bottled before this movement is finished it is sure to deposit in the bottles. The bins for bottled wines here are all in brickwork, and they do not like iron bins. We were shown still white wines from 18s. to Johannesburg at 70s. We liked a Steinberg at 48s. best, it reminded us of the Pewsey Vale Reising, but was not nearly so strong. We also tasted some very fine light red wines. They are very light, and do not require water. We happened to have a small sample of Shiras made on the hills near Gawler with us, and Mr. Wegler and another member of the firm tasted it, and were surprised at the good quality of it; it is much deeper in colour than any of their red wines. The strength of their white wines is seldom over 12° of alcohol or 21° of proof

spirit, and the red less than the white, which was found to be invariably the case in all the countries we have visited. They have paid this year as high as 5s. per gallon for the new wine from choice vineyards. They have a vineyard of ten acres near Rudesheim, and consider that a pretty large one for this country. Mr. W. also said that he had known of a vineyard having been sold for the extraordinary sum of £2,000 per acre, and that the price ranged from that to £150 per acre, according to the quality of the wine made. After leaving Coblenz we went on to Cologne, and near there we got away from the Mountains and left them and the vines behind us, and so ends our pleasant, and, I trust, profitable trip among the vineyards of Europe. We should have liked to have been able to have made a longer stay at many places, especially in the south of Spain, where the climate and soil is so much like that of our own country, and the man who can spare the time and money to remain there for a year or more, and study and examine thoroughly all the different cultures which at present we know so little about, might do a great amount of good, not only to the colony, but to all Australia.

Among the many pleasant recollections of our trip is that of our reception, in all countries we have visited, by our brother vine-growers and wine merchants, and their readiness to afford us all the information we could wish for, and our heartfelt thanks are due and hereby recorded to all of them for their kindness to us.



THE VINEYARDS OF SOUTH AUSTRALIA.

No. 1.—TINTARA.

[From the *Federal Australian*, September 20, 1884.]

THE traveller in search of the wild beauties of nature in this sunny land, cannot do better than visit the vineyards and orchards south of Adelaide. Tintara, the largest of them, is situated due south from the city, and can be reached by following the main road to Clarendon, eighteen miles from Adelaide. This is one of the prettiest drives, and Clarendon one of the neatest of villages, and is much visited during the spring and summer by pleasure parties from the city. The river Onkaparinga is here crossed, and from the bridge a magnificent view is obtained of the Clarendon vineyard—one of the oldest in the colony—and which we shall describe farther on. About a mile from here a bush road turns off to the right, and follows for about seven miles the "range road," or water shed of the river, through seven miles of scrubby country, now gay with wattles and other plants in bloom. At this point the Tintara Estate is reached. It was originally purchased from the Government by a small company of wealthy colonists in conjunction with the late Dr. A. C. Kelly, as managing partner. He is well known to all Australian vigneronas as the author of "The Vine in Australia," and "Wine and Wine-making in Australia." The vineyard was planted by him in 1863, and continued under his management until 1877, when it came into the possession of the present owner, Mr. Thomas Hardy.

The original purchase was about 217 acres, but another 80-acre section was added in 1872 or 1873, and Mr. Hardy has since purchased two adjoining blocks of 987 and 489 acres,

making altogether 1,166 acres. The estate is now nearly three miles in length, with a creek running through the centre of it. The hills on both sides are admirably adapted to the growth of the vine. The soil is generally of a light sandy loam, resting on a red clay bottom, the crest of the hills being full of ironstone in large boulders, and the slopes in most parts contain ironstone gravel in the soil. The earliest planting was made with red grapes, consisting of the Carbenet, Shiraz or Hermitage, Mataro, Oarignan, and Grenache. They were planted in rows nine feet apart and four and a-half feet in the rows, which follow the contour of the hills, and give the vineyard a very pretty appearance from all points of view. The vines are all, with the exception of the Shiraz, grown on what is termed the gooseberry bush system. The Shiraz are trained on low trellises of two wires. The average crop in the old vineyard is only 150 gallons to the acre. Mr. Hardy has added about 60 acres more vines, principally of the Doradilla a Spanish vine, very productive and easily cultivated, and giving a good clean light white wine. Dr. Kelly on a visit to France in 1872-3, introduced the Sauvignon Blanc, one of the Sauterne grapes from the Bordeaux vineyards, and a few acres were grafted to them, and have given a very superior wine; but the yield is so miserably small that only ten acres more have been planted of this kind. The land is all cultivated with the plough and scarifier; a double-furrow plough is used. The vineyard has been worked very satisfactorily for the proprietor for the last six years by A. and H. Howard (father and son), both practical men, at a given rate per gallon on the quantity of wine made, the lessees finding horses and labour up to the delivery of the grapes to the cellar. The wines are fermented in slate tanks, each containing 800 gallons. The wine is made under the care of Mr. J. G. Kelly, who is the son of Dr. Kelly, and an ardent viticulturist, and worthy follower in his father's footsteps.

The wines from this vineyard are now nearly all shipped to the order of a London firm, and are fast making a name in England. They are sent forward at three years old, and the red wines are deep in colour, and soft and pleasant in flavour. They have been favourably noticed by the *Lancet*, and by Dr. Druitt in his work on wines. They usually reach to nearly 26° in strength, without any addition of spirit, and are amongst the strongest natural wines of Australia. Mr. Hardy has several other vineyards—in all over 300 acres—in the same locality, one of them, a currant vineyard, of 35 acres, which we hope to describe in a future number.

NO. 2—BANKSIDE, NEAR ADELAIDE.

By BRUNI.

[From the *Australasian*, May 24, 1884.]

NO any one who takes an interest in the development of the industrial resources of Australia, there can be no more interesting a trip than a visit to Bankside, the property of Mr. Thomas Hardy. Though of very small extent—the area is only 60 acres—Bankside yields a more varied produce, and furnishes a better illustration of the capabilities of the soil and climate of the district in which it is situated than any other estate within the widespread borders of Australia. To most of the Australian-born a visit to the place will be found invaluable from an educational point of view, and after witnessing the skill, energy, and intelligence that has been brought to bear in developing the industries so successfully established, one cannot help contrasting the supineness of the various governments in the Australian colonies in providing agricultural education for our youth, with the results achieved by individual enterprise.

Bankside is only three miles out of Adelaide, and the drive through the lucerne fields is a very pleasant one. The road up to the house is planted on each side with olive trees, which grow with a luxuriance I have seen in no other part of the world. I found the olive trees on one side of the road put to a novel use. They have been trimmed four feet from the ground, and the trees used as posts to run fencing wire through. Mr. Hardy has for years past made experiments in the way of using live trees as a substitute for posts, and finds that running the wire through the tree in no way injures its growth. This is a question of considerable importance in a country possessing such large treeless areas as South Australia. These olives are now coming into bearing, and besides being ornamental as an avenue, are useful as a fence, and at the same time furnish a fine yield of fruit, which is readily purchased by the oil makers. The variety grown is Hardy's Mammoth, which was raised at Bankside, and is remarkable for the size of its fruit. Near the house is a still handsomer avenue of olives, the trees in which are 25 years old. These trees give excellent yields, but the difficulty here, as else-

where in Australia, is the cost of gathering. The fruit clings tenaciously to the tree, and cannot be shaken off like most fruits when fully ripe. It has been found the best plan to lay cloths under the tree and strike the branches with the hand, winnowing out the leaves afterwards. All the olive trees I saw at Bankside are extremely healthy, and no sign of scale among them.

Olive-growing is, however, the least important of the various products of Bankside, and I readily turned from the olive walks to follow the grapes through the various processes they undergo before they are turned out as the raisins of commerce. When the grapes are to be made into pudding raisins—and this is by far the larger product—the bunches of ripe fruit are placed in oblong sieves, and plunged for 20 seconds into a tank of boiling lye. These sieves contain about 40 pounds of grapes, and are handled by two men. The lye used is made from the ashes which are got from the vine prunings. This dipping takes the bloom off the fruit, but causes it to dry in one-third the time it would otherwise take. The next stage is to spread the grapes evenly on paling trays five feet by two and a-half feet, and expose them to the sun. This is done in a small paddock of about an acre and a-half. In the season this is quite covered with the trays, and in case of rain are piled over one another to a height of four feet, and securely covered. Mr. Hardy has designed a new kind of tray made of Oregon laths, which are set at a small distance apart to allow a free current of air. This, he believes, will answer better than the close paling trees. When the grapes are about three parts dried they are removed to the kilns in the centre of the paddock. They are built of "cob," as it is called in Devonshire, the walls being eighteen inches thick, and with an arched roof of the same material, and which is found to answer admirably for the purpose. There are two large kilns alongside each other about 60 feet long by 8 feet wide, and the trays are placed on racks about nine inches apart on each side. The kilns are heated with hot air pipes, and the drying is completed in from twelve to twenty-four hours, when the raisins are taken out of the kilns and while still crisp they are rubbed free of the stalks, which is then easily done. The next process is to run them through a winnowing machine, which separates a greater portion of the stalks. They are then packed in boxes by young girls, and pressed with a handy screw press six at a time. The sizes used contain 28 and 56 pounds each. In appearance and flavour the Bankside raisins compare very favourably with the best European ones, and by many are preferred to the imported fruit; the only difference they exhibit is that they are not quite so large as the best European samples. Currants, of which a considerable quantity, are made in a similar manner, but require no dipping.

They have a fresher appearance, and are certainly much freer from foreign matter than European currants.

When it is intended to make table raisins the process is somewhat different from that employed in making the pudding raisins. The grapes are not dipped, as that would spoil the appearance by removing the bloom. They are carefully spread on floors made like a large melon frame about 14 feet square, and with a pretty steep inclination toward the sun. This is covered with gravel in which the grapes are laid. I was surprised to learn that it is not found necessary to turn them, the under grapes drying as well as the top ones from the heat of the gravel floor. When finished they present a very handsome appearance, and are quite as good to taste as to look at. They are packed in neat flat boxes containing 40 pounds each, in two layers in each box. The kind of grape used for both kinds of raisins is the Muscat Gordo Blanco, and Mr. Hardy has ascertained from personal observation made during a recent visit to Spain and Portugal that this is the kind used at Malaga and Valencia for the best raisins.

A considerable quantity of Sultana raisins are made from that variety of grape. In appearance I could not see any difference between them and the imported Sultana raisins.

From raisins we naturally turn to almonds, and after seeing the process of raisin making I was taken to see the almonds. The trees are mostly grown in single lines along the banks of the river Torrens, and are like the olives, made to do duty as fencing posts. The kinds grown are the Brandis, l'aper Shell, and a small round nut named the "Picnic," a very excellent nut raised in the colony. The production of dried fruit is about twenty tons each year. The price fluctuates owing to the market being occasionally glutted with European fruit, and which is often sold at a sacrifice. Once the demand for dried fruits is equal to the demand the industry will be a more profitable one, as the imported fruit being beaten out of the competition, the market will not be liable to such disastrous fluctuations as have lately occurred.

In the centre of the ground is a fine orangery in which the trees are growing as well as any I have visited in Australia. By means of a steam pump they are irrigated with water drawn from the river Torrens. After watering the trees are mulched with fresh horse-dung; from two to three waterings in the season are generally sufficient. A few trees are outside the line of irrigation, and a marked difference is seen in the quality of the fruit, that from the unwatered trees being coarse in the skin and not so well flavoured. Some fine varieties of the Citron are grown here, one of which, the Bengal Citron, is as large as a rock melon. The tree is a handsome one, and with its immense fruit presents a very striking appearance. A large number of

Seville oranges are grown, and the fruit sold for marmalade making, in which Adelaide is far before any other town in Australia.

Handsome as is the orangery, it is fairly eclipsed by the lemon orchard—indeed I never saw anything half so attractive. The lemon-tree is generally a straggling tree, possessing little beauty of form, but here, with regular pruning, they are kept as handsome and compact as the orange-tree, and are in constant bearing; the blossom, green and ripe fruit being found on the same tree nearly every month in the year. There is a ready sale for the fruit during the long summer of South Australia, and in the winter the fruit is sold for the manufacture of candid peel.

The vineyard occupies the greater portion of the property, the area under vines being thirty-five acres. The first plantation was made in 1853. Shiraz is grown for wine, but a considerable area is taken up with raisin and currant grapes. The yield is heavy, from four to six tons to the acre. In addition to his own vineyards Mr. Hardy purchases large quantities of grapes from neighbouring vineyards. The Shiraz vines are pruned long, two rods of eight to ten eyes being left on each side of the vine. They are trellised with two wires on posts thirty to forty feet apart. The Muscats are pruned very short, and trellised with stout posts and one wire; the object in this case is to prevent the fruit from being scorched by the sun, by supporting the young growth and foliage.

The vines which produce the currants are of two kinds—the Zante and the Corinth—and though the grapes are so small the vines that grow them is remarkably robust, and require to be trellised to give them as much room to spread as is possible, that being found to increase the yield materially, and various kinds of trellis are being tried, the latest idea being a leaning trellis which allows the grapes to hang clear of the foliage; this is done to allow a free current of air through the vine. These vines require a good deal of room, and a vineyard in another district owned by Mr. Hardy he has planted them at twenty-four feet apart in the rows, and twelve feet from row to row. Between each two currant vines are planted three vines for wine and which it is intended to remove when the currants require all the ground, which is not expected to be for at least ten years, as they take about that time to come into full bearing.

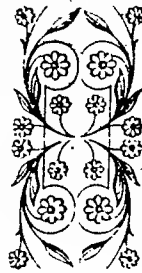
The cellars at Bankside are very extensive, and consist of one floor below ground, with two stories above. The grapes are brought into the cellars in waggons, and hoisted by a small steam-engine to the second storey, where they are run through a crusher and then stalked by a machine. Three or four small-sized presses are used, which are shifted from place to place as required. Slate vats from 800 to 1,000 gallons are used for fermenting, for

which purpose they are well suited. The cellars throughout are open inside, so as to give a thorough ventilation. The appearance of the place on looking up from the underground cellar through a forest of posts and beams is striking, and the possibility of one of those great casks of wine coming down "by the run," strikes one rather forcibly. The timber is well looked after, so as to prevent the white ants from effecting a lodgement. Some time ago these pernicious insects built a covered way two inches long from the wall to a cask, and they were not discovered till the contents were taken out and the casks cleaned. The practice at Bankside is to put the strong rich wines in the upper portion of the cellar, and reserve the lower portion for the lighter wines. On the underground floor there are some cellars arched over with stone, while smaller branches are cut out of the solid earth. In a little retreat of this description I tasted a splendid red wine, twelve years old, that would be difficult to surpass in the best cellars of Burgundy. A Reising of about the same age was different to any wine made from the grapes that I have met with. It was very clean, delicate in flavour, and had a bouquet I have never known equalled by an Australian wine. Red wines of exceptional character are sent out from here, which are blended in Mr. Hardy's town cellars. About fifteen men are constantly employed at Bankside, while during the vintage about sixty boys and girls from the neighbouring villages are engaged to assist in the work. It is the custom of the place to have a merry making at the close of the vintage, in which about 200 persons usually take part.

The Bankside property consists of about 60 acres of very deep chocolate soil, resting on a strong clay. Trees of all kinds appear to thrive admirably in this deep rich soil, and yield large crops of fruit. Irrigation is easily practised over this small area. Water is raised from the bed of the Torrens river to the top of the bank, and that being higher than the surrounding country it is very easy distributed. With its olives and almond groves, orange and lemon orchards, fruit trees and vineyards, there is no place in Australia gives such an interesting and varied product as this little spot.

Mr. Hardy has purchased several vineyards in various districts near Adelaide—the most important one being Tintara, situated about 25 miles to the south of Adelaide, where he has 150 acres under vines. The produce of all these vineyards when matured is brought into his stores in Currie-street, Adelaide, the last year's yield being 102,000 gallons of wine. A large quantity of wine is shipped to the London market, where it is rapidly growing in favour. The Adelaide cellars are very well arranged for carrying on the business effectively and rapidly. One peculiarity of the local trade is the form in which the wine is

sent out. Stout glass flasks, containing half-a-gallon of wine are much used, and are preferred to the ordinary earthenware jars. These glass flasks are made by the Melbourne Glass Bottle Company. Not the least important portion of the management of the wine is performed by Signor P. Villahes, who makes a careful analysis of each sample of wine as a guide to the proprietor to be used in making the various blends. The industries carried on at Banksia are of the highest importance to the country, and no visitor to Adelaide should neglect to see this interesting little plot of land, on which so much good work has been done.



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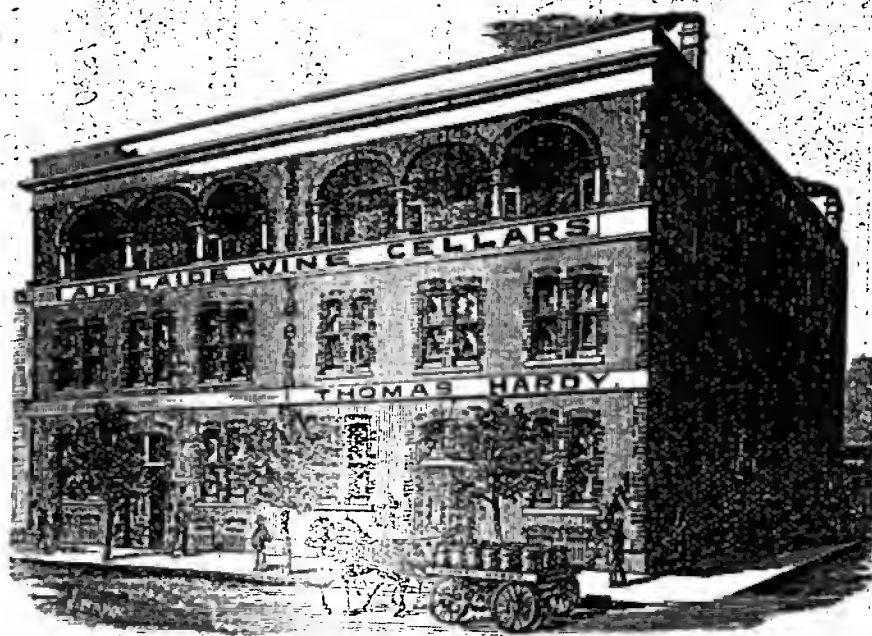
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